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SHARP 21BM2GMK2 SERVICE MANUAL

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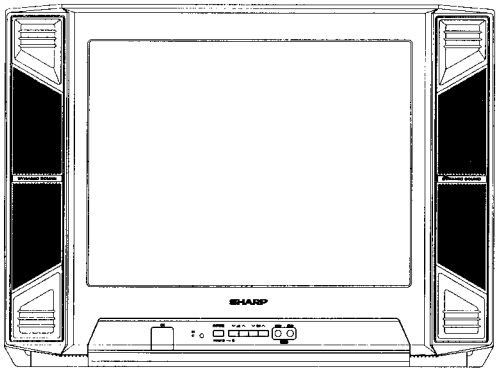
SHARP SERVICE MANUAL

SX2T821BM2GMK



COLOUR TELEVISION

Chassis No. GA-1

MODEL 21BM2GMK2

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

FEATURES

- Multi 18 systems
- Full Auto Channel Preset and Auto Channel Skip
- 100-CH Program Memory
- CATV(Hyper Band) Ready
  <Used Frequency Synthesizer Tuner>
- AVL(Sound Keeper) Function
- High Contrast Picture (Black Stretch Circuit)
- On Timer/Sleep Timer/Reminder Timer
- Blue Back Noise Mute
- Front AV-In & Rear AV-In/Out Terminals (Front Priority)
- Colour Comb Filter(NTSC only)
- Hotel Mode
- Arabic/Chinese/English/French/Malay/Russian 6 Languages OSD
- White Temperature Adjustment

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WARNING

The chassis in this receiver is partially hot. Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis. To prevent electric shock, do not remove cover. No user – serviceable parts inside. Refer servicing to qualified service personnel.

SHARP CORPORATION

SPECIFICATIONS

Convergence	Self Convergence System
Focus	Quadra-Potential Electrostatic
Sweep Deflection	Magnetic
Intermediate Frequencies	
Picture IF Carrier	38.9MHz
Sound IF Carrier Frequency	
6.5MHz	32.4MHz
6.0MHz	32.9MHz
5.5MHz	33.4MHz
Colour Sub-Carrier Frequency	34.47MHz
Power Input	110 ~ 240V AC 50/60 Hz
Power Consumption	79W
Audio Power Output Rating	5.0W(at Max.)
Speaker	
Size	5 x 9 cm Elliptic (2 pcs)
Voice Coil Impedance	16 ohms at 400 Hz
Aerial Input Impedance	
VHF/UHF	75 ohms Unbalanced
Receiving System	PAL-B/G,D/K,I SECAM-B/G,D/K,K1
Tuner Ranges	
VHF-Channels	E2(48.25MHz) thru E12(224.25MHz) C1(49.75MHz) thru C12(216.25 MHz) S1(105.25MHz) thru S36(423.25HMz)
UHF-Channels	E21(471.25MHz) thru E69(855.25MHz) C13(471.25MHz) thru C57(863.25MHz) S37(431.25MHz) thru S41(463.25MHz)
Dimensions	Width: 642.0mm Height: 474.5mm Depth: 478.0mm Weight(approx): 21.5 kg
Cabinet material	All Plastics

Specifications are subject to change without prior notice.

IMPORTANT SERVICE NOTES

Maintenance and repairing of this receiver should be done by qualified service personnel only.

SERVICE OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove static charge from it by Connecting a 10K ohm Resistor in series with an insulated wire(such as a test probe) between picture tube dag and 2nd anode lead. (AC line cord should be disconnected from AC outlet.)

1. **Picture tube in this receiver employs integral implosion protection.**
2. **Replace with tube of the same type number for continued safety.**
3. **Do not lift picture tube by the neck.**
4. **Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely.**

X-RAY

This receiver is designed so that any X-Ray radiation is kept to an absolute Minimum. Since certain malfunctions or servicing may produce potentially hazardous radiation with prolonged exposure at close range, the following precautions should be observed:

1. **When repairing the circuit, be sure not to increase the high voltage to more than 28.0kV(at beam 0 μA) for the set.**
2. **To keep the set in a normal opeartion , be sure to make it function on 24.8kV±1.5kV(at beam 1100 μA) in the case of the set. The set has been factory - Adjusted to the above-mentioned high voltage.**
   - *** If there is a possibility that the high voltage fluctuates as a result of the repairing, never forget to check for such high voltage after the work.**
3. **Do not substitute a picture tube with unauthorizerd types and/or brands which may cause excess X-ray radiation.**

BEFORE RETURNING THE RECEIVER

Before returning the receiver to the user, perform the following safety Checks.

1. **Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.**
2. **Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor- capacity networks, mechanical insulators etc.**

ADJUSTMENT PRECAUTIONS

This model's setting are adjusted in two different ways: through the I²C bus control and in the conventional analog manner. The adjustments via the I²C bus control include preset-only items and variable data.
CAUTION: Make sure TV Set in "Normal Condition" before switch to Service Mode for adjustment.

1. Setting the service mode by the microprocessor.

①. Short JA 137 & JA 138 for 1 second and release to switch to the service mode position, and the microprocessor is in input mode. (Adjustment through the I2C bus control). (Use JWS Key to set as well).

②. Press the CH DOWN / UP key on the remote controller to get ready to select the mode one by one.

③. Press the CH DOWN / UP key on the remote controller to select the modes reversibly one by one.

④. Using the VOLUME UP/ DOWN key on the remote controller, the data can be modified.

⑤. Short JA 137 & JA 138 for 1 second and release to switch to the normal mode (OFF) position, and the microprocessor is in out of the service mode.

2. Factory Presetting.

①. Short JA 137 & JA 138 then turn "ON" the main power and release to switch to the Service Mode position.Initial values are automatically preset, only when a new EEPROM is used (Judge with the first 4 bytes).

②. The initial data are preset as listed in page 8, 9, & 10.

③. Make sure the data need modify or not (Initial data).

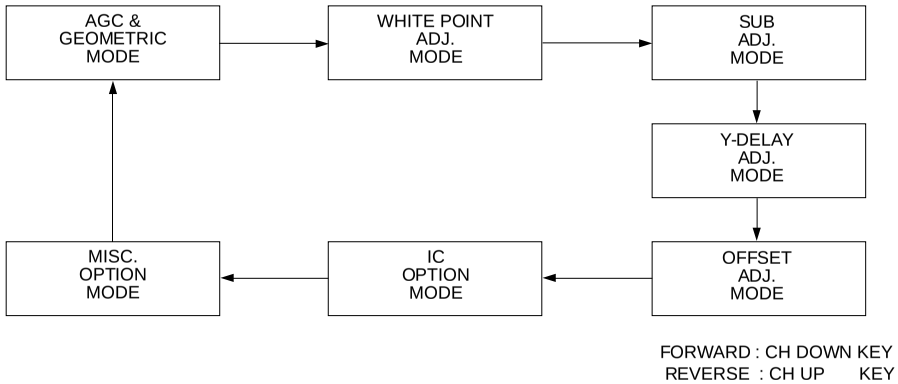
Note: Once the chassis has been assembly together and ready to be POWER ON for the FIRST TIME, make sure to short JA137 & JA138 to switch to the service mode position first and then turn on the main power switch (See 2-(1) above).

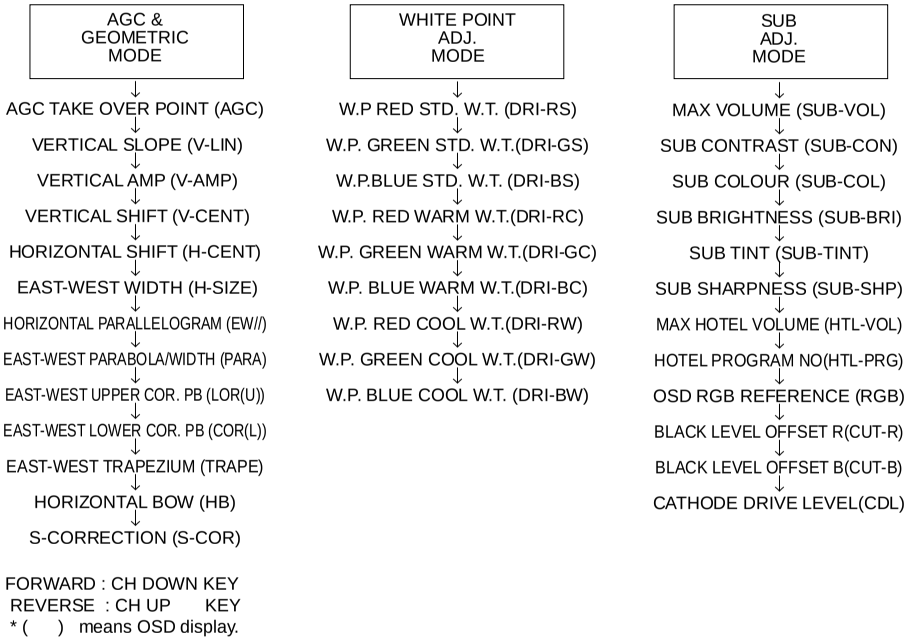
Precaution: If haven't done this initiation, it may possibly generate excessive Beam current.

3. For reference please check with memory map (GA-1AM Series type RH-IX3368CEN6)

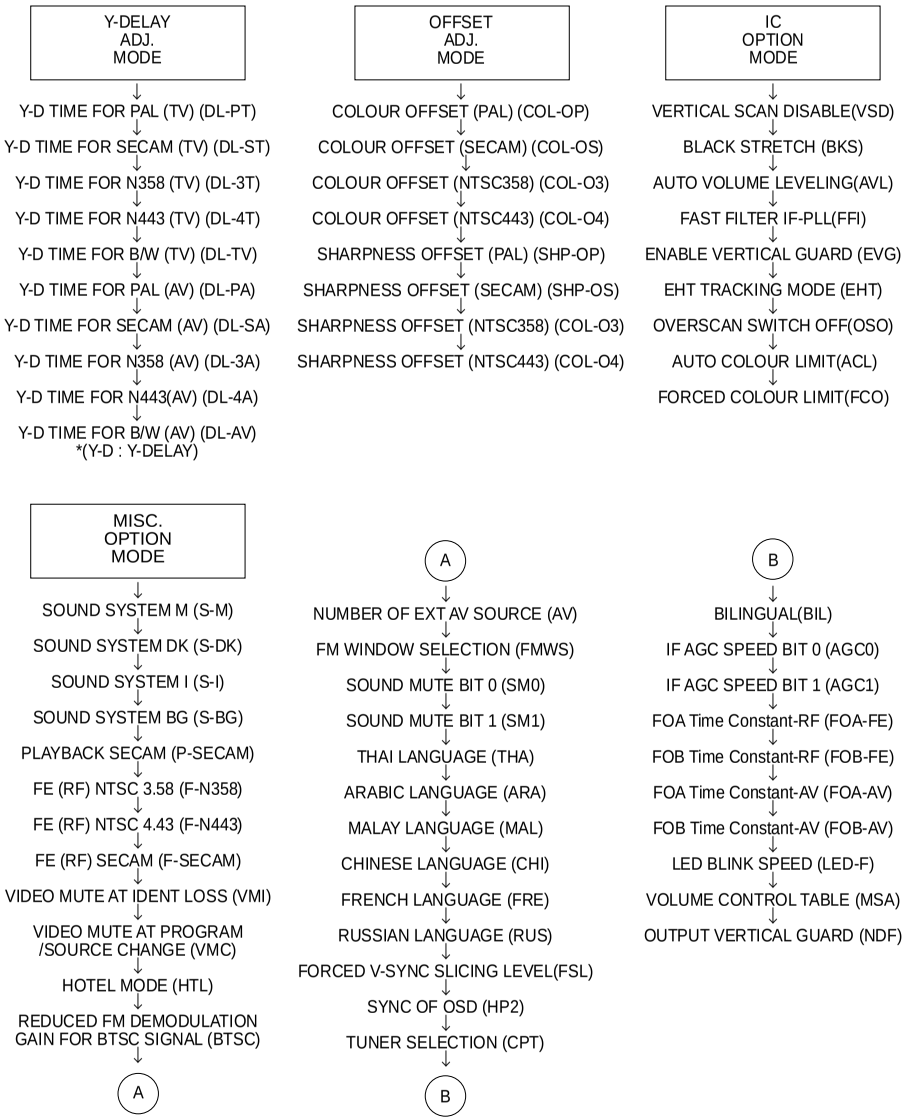
■ SERVICE MODE

(1) In the Service Mode, Key is used to select the mode in the following order.





FORWARD : CH DOWN KEY
REVERSE : CH UP KEY
* ( ) means OSD display.


Y-DELAY ADJ. MODE
Y-D TIME FOR PAL (TV) (DL-PT)
Y-D TIME FOR SECAM (TV) (DL-ST)
Y-D TIME FOR N358 (TV) (DL-3T)
Y-D TIME FOR N443 (TV) (DL-4T)
Y-D TIME FOR B/W (TV) (DL-TV)
Y-D TIME FOR PAL (AV) (DL-PA)
Y-D TIME FOR SECAM (AV) (DL-SA)
Y-D TIME FOR N358 (AV) (DL-3A)
Y-D TIME FOR N443(AV) (DL-4A)
Y-D TIME FOR B/W (AV) (DL-AV)
*(Y-D : Y-DELAY)
OFFSET ADJ. MODE
COLOUR OFFSET (PAL) (COL-OP)
COLOUR OFFSET (SECAM) (COL-OS)
COLOUR OFFSET (NTSC358) (COL-O3)
COLOUR OFFSET (NTSC443) (COL-O4)
SHARPNESS OFFSET (PAL) (SHP-OP)
SHARPNESS OFFSET (SECAM) (SHP-OS)
SHARPNESS OFFSET (NTSC358) (COL-O3)
SHARPNESS OFFSET (NTSC443) (COL-O4)
IC OPTION MODE
VERTICAL SCAN DISABLE(VSD)
BLACK STRETCH (BKS)
AUTO VOLUME LEVELING(AVL)
FAST FILTER IF-PLL(FFI)
ENABLE VERTICAL GUARD (EVG)
EHT TRACKING MODE (EHT)
OVERSCAN SWITCH OFF(OSO)
AUTO COLOUR LIMIT(ACL)
FORCED COLOUR LIMIT(FCO)
MISC. OPTION MODE
SOUND SYSTEM M (S-M)
SOUND SYSTEM DK (S-DK)
SOUND SYSTEM I (S-I)
SOUND SYSTEM BG (S-BG)
PLAYBACK SECAM (P-SECAM)
FE (RF) NTSC 3.58 (F-N358)
FE (RF) NTSC 4.43 (F-N443)
FE (RF) SECAM (F-SECAM)
VIDEO MUTE AT IDENT LOSS (VMI)
VIDEO MUTE AT PROGRAM /SOURCE CHANGE (VMC)
HOTEL MODE (HTL)
REDUCED FM DEMODULATION GAIN FOR BTSC SIGNAL (BTSC)
A
A
NUMBER OF EXT AV SOURCE (AV)
FM WINDOW SELECTION (FMWS)
SOUND MUTE BIT 0 (SM0)
SOUND MUTE BIT 1 (SM1)
THAI LANGUAGE (THA)
ARABIC LANGUAGE (ARA)
MALAY LANGUAGE (MAL)
CHINESE LANGUAGE (CHI)
FRENCH LANGUAGE (FRE)
RUSSIAN LANGUAGE (RUS)
FORCED V-SYNC SLICING LEVEL(FSL)
SYNC OF OSD (HP2)
TUNER SELECTION (CPT)
B
B
BILINGUAL(BIL)
IF AGC SPEED BIT 0 (AGC0)
IF AGC SPEED BIT 1 (AGC1)
FOA Time Constant-RF (FOA-FE)
FOB Time Constant-RF (FOB-FE)
FOA Time Constant-AV (FOA-AV)
FOB Time Constant-AV (FOB-AV)
LED BLINK SPEED (LED-F)
VOLUME CONTROL TABLE (MSA)
OUTPUT VERTICAL GUARD (NDF)

* Direct Key-in for Service Item in Service Mode

RC COMMAND	SERVICE-ITEM
FUNCTION	AGC
CONTRAST DOWN	V-LIN
COLOUR DOWN	V-AMP
BRIGHTNESS DOWN	V-CENT
TINT DOWN	H-CENT
SHARPNESS DOWN	EW / /
SYSTEM	HB
BLUEBACK	S-COR
TIMER	SUB-VOL
CONTRAST UP	SUB-CON
COLOUR UP	SUB-COL
BRIGHTNESS UP	SUB-BRI
TINT UP	SUB TINT
SHARPNESS UP	SUB-SHP

AFTER SHORT JA 137 & JA 138 ,AND TURN ON THE MAIN POWER SWITCH,READ DATA FROM EEPROM ADDRESS 00H ~ 03H,AND COMPARE TO THE LIST BELOW, IF DIFFERENT, INITIALIZE THE EEPROM.

Address	:	Data	Address	:	Data
00H	:	55H	02H	:	43H
01H	:	4FH	03H	:	A1H

EEPROM ITEMS	OSD	DATA LENGTH	INITIAL DATA	FIX/ADJ	REMARK
AGC TAKE OVER POINT	AGC	0~63	14	ADJ	
VERTICAL SLOPE	V-LIN	0~63	32	ADJ	
VERTICAL AMPLITUDE	V-AMP	0~63	32	ADJ	
VERTICAL SHIFT	V-CENT	0~63	32	ADJ	
HORIZONTAL SHIFT	H-CENT	0~63	32	ADJ	
EAST-WEST WIDTH	H-SIZE	0~63	32	*FIX	
HORIZONTAL PARALLELOGRAM	EW//	0~63	32	*FIX	
EAST-WEST PARABOLA/WIDTH	PARA	0~63	32	*FIX	
EAST-WEST UPPER CORNER PARABOLA	COR (U)	0~63	32	*FIX	
EAST-WEST LOWER CORNER PARABOLA	COR (L)	0~63	32	*FIX	
EAST-WEST TRAPEZIUM	TRAPE	0~63	32	*FIX	
HORIZONTAL BOW	HB	0~63	32	*FIX	
S-CORRECTION	S-COR	0~63	0	ADJ	*4
WHITE POINT RED STD WHITE TEMP	DRI-RS	0~63	32	*FIX	
WHITE POINT GREEN STD WHITE TEMP	DRI-GS	0~63	32	ADJ	
WHITE POINT BLUE STD WHITE TEMP	DRI-BS	0~63	32	ADJ	
WHITE POINT RED COOL WHITE TEMP	DRI-RC	0~63	25	ADJ	*3
WHITE POINT GREEN COOL WHITE TEMP	DRI-GC	0~63	32	ADJ	(DRI-GS)-7 DATA*3
WHITE POINT BLUE COOL WHITE TEMP	DRI-BC	0~63	32	ADJ	SAME AS (DRI-BS) DATA
WHITE POINT RED WARM WHITE TEMP	DRI-RW	0~63	32	*FIX	
WHITE POINT GREEN WARM WHITE TEMP	DRI-GW	0~63	32	ADJ	(DRI-GS)-7 DATA
WHITE POINT BLUE WARM WHITE TEMP	DRI-BW	0~63	32	ADJ	(DRI-BS)-7 DATA
MAX VOLUME	SUB-VOL	0~63	63	*FIX	
SUB CONTRAST	SUB-CON	0~63	63	*FIX	
SUB COLOUR	SUB-COL	0~63	32	ADJ	
SUB BRIGHTNESS	SUB-BRI	0~63	32	ADJ	
SUB TINT	SUB-TINT	0~63	32	ADJ	
SUB SHARPNESS	SUB-SHP	0~63	32 (20)	*FIX	
MAX HOTEL VOLUME	HTL-VOL	0~63	32	*FIX	
HOTEL PROGRAM NUMBER	HTL-PRG	0~99 OR>99FOR NONE	255	*FIX	
OSD GRB REFERENCE	RGB	0~15	15	*FIX	
BLACK LEVEL OFF-SET R	CUT-R	0~63	32	ADJ	
BLACK LEVEL OFF-SET G	CUT-G	0~63	32	ADJ	
CATHODE DRIVE LEVEL	CDL	0~15	0	ADJ	*2
Y-DELAY TIME FOR PAL(TV) [YD]	DL-PT	0~15	12	*FIX	
Y-DELAY TIME FOR SECAM(TV) [YD]	DL-ST	0~15	15	*FIX	
Y-DELAY TIME FOR N358 (TV) [YD]	DL-3T	0~15	12	*FIX	
Y-DELAY TIME FOR N443 (TV) [YD]	DL-4T	0~15	12	*FIX	
Y-DELAY TIME FOR B/W (TV) [YD]	DL-TV	0~15	12	*FIX	
Y-DELAY TIME FOR PAL (AV) [YD]	DL-PA	0~15	12	*FIX	
Y-DELAY TIME FOR SECAM (AV) [YD]	DL-SA	0~15	15	*FIX	
Y-DELAY TIME FOR N358 (AV) [YD]	DL-3A	0~15	12	*FIX	
Y-DELAY TIME FOR N443 (AV) [YD]	DL-4A	0~15	12	*FIX	
Y-DELAY TIME FOR B/W (AV) [YD]	DL-AV	0~15	12	*FIX	
COLOUR OFFSET (PAL)	COL-OP	0~15	8	ADJ	*5
COLOUR OFFSET (SECAM)	COL-OS	0~15	8	ADJ	*5
COLOUR OFFSET (NTSC358)	COL-O3	0~15	4	ADJ	*5
COLOUR OFFSET (NTSC443)	COL-O4	0~15	4	ADJ	*5
SHARPNESS OFFSET (PAL)	SHP-OP	0~15	8	*FIX	
SHARPNESS OFFSET (SECAM)	SHP-OS	0~15	4	*FIX	
SHARPNESS OFFSET (NTSC358)	SHP-O3	0~15	12	FIX	
SHARPNESS OFFSET (NTSC443)	SHP-O4	0~15	8	*FIX	
VERTICAL SCAN DISABLE	VSD	0(DISABLE)/1(ENABLE)	0	*FIX	
BLACK STRETCH	BKS	0(DISABLE)/1(ENABLE)	1	*FIX	
AUTOMATIC VOLUME LEVELING	AVL	0(DISABLE)/1(ENABLE)	1	*FIX	
FAST FILTER IF-PLL	FFI	0(DISABLE)/1(ENABLE)	0	*FIX	
ENABLE VERTICAL GUARD (RGB BLANKING)	EVG	0(DISABLE)/1(ENABLE)	1	*FIX	
EHT TRACKING MODE (HCO)	EHT	0(DISABLE)/1(ENABLE)	1	*FIX	
OVERSCAN SWITCH OFF	OSO	0(DISABLE)/1(ENABLE)	0	*FIX	
AUTO COLOUR LIMIT	ACL	0(DISABLE)/1(ENABLE)	0	*FIX	
FORCED COLOUR LIMIT	FCO	0(DISABLE)/1(ENABLE)	0	*FIX	
SOUND SYSTEM M	S-M	0(DISABLE)/1(ENABLE)	0	*FIX	
SOUND SYSTEM DK	S-DK	0(DISABLE)/1(ENABLE)	1	*FIX	
SOUND SYSTEM I	S-I	0(DISABLE)/1(ENABLE)	1	*FIX	
SOUND SYSTEM BG	S-BG	0(DISABLE)/1(ENABLE)	1	*FIX	
PLAYBACK SECAM	P-SECAM	0(DISABLE)/1(ENABLE)	1	*FIX	
FE (RF) NTSC 3.58	F-N358	0(DISABLE)/1(ENABLE)	0	*FIX	
FE (RF) NTSC 4.43	F-N443	0(DISABLE)/1(ENABLE)	1	*FIX	
FE (RF) SECAM	F-SECAM	0(DISABLE)/1(ENABLE)	1	*FIX	
VIDEO MUTE AT IDENT LOSS	VMI	0(DISABLE)/1(ENABLE)	1	*FIX	
VIDEO MUTE AT PROGRAM/SOURCE CHANGE	VMC	0(DISABLE)/1(ENABLE)	1	*FIX	
HOTEL MODE	HTL	0(DISABLE)/1(ENABLE)	0	*FIX	
REDUCED FM DEMODULATOR GAIN FOR BTSC SIGNAL	BTSC	0(DISABLE)/1(ENABLE)	0	*FIX	
NUMBER OF EXTERNAL AV SOURCE	AV	0 FOR1 AV/1 FOR 2AV	1 (0)	*FIX	
FM WINDOW SELECTION	FMWS	0(DISABLE)/1(ENABLE)	0	*FIX	
SOUND MUTE BIT 0	SM0	0(DISABLE)/1(ENABLE)	1	*FIX	
SOUND MUTE BIT 1	SM1	0(DISABLE)/1(ENABLE)	0	*FIX	
THAI LANGUAGE	THA	0(DISABLE)/1(ENABLE)	0	*FIX	
ARABIC LANGUAGE	ARA	0(DISABLE)/1(ENABLE)	1	*FIX	
MALAY LANGUAGE	MAL	0(DISABLE)/1(ENABLE)	1	*FIX	
CHINESE LANGUAGE	CHI	0(DISABLE)/1(ENABLE)	1	*FIX	
FRENCH LANGUAGE	FRE	0(DISABLE)/1(ENABLE)	1	*FIX	
RUSSIAN LANGUAGE	RUS	0(DISABLE)/1(ENABLE)	1	*FIX	
FORCED V-SYNC SLICING LEVEL	FSL	0(DISABLE)/1(ENABLE)	0	*FIX	
SYNC OF OSD	HP2	0(DISABLE)/1(ENABLE)	0	*FIX	
TUNER SELECTION (0:SHARP/ALPS;1:MURATA)	CPT	0(DISABLE)/1(ENABLE)	0	*FIX	
BILINGUAL	BIL	0(DISABLE)/1(ENABLE)	0	*FIX	
IF AGC SPEED BIT 0	AGC0	0(DISABLE)/1(ENABLE)	1	*FIX	
IF AGC SPEED BIT 1	AGC1	0(DISABLE)/1(ENABLE)	0	*FIX	
PHI-1 TIME CONSTANT (RF)	FOA-FE	0(DISABLE)/1(ENABLE)	0	*FIX	
PHI-1 TIME CONSTANT (RF)	FOB-FE	0(DISABLE)/1(ENABLE)	0	*FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOA-AV	0(DISABLE)/1(ENABLE)	1	*FIX	
PHI-1 TIME CONSTANT (OFF AIR)	FOB-AV	0(DISABLE)/1(ENABLE)	1	*FIX	
LED BLINK SPEED	LED_F	0(DISABLE)/1(ENABLE)	0 (1)	*FIX	
VOLUME CONTROL PWM TABLE	MSA	0(DISABLE)/1(ENABLE)	0 (1)	*FIX	
OUTPUT VERTICAL GUARD	NDF	0(DISABLE)/1(ENABLE)	0 (1)	*FIX	

NOTE :

1) *FIX: PLEASE DO NOT CHANGE FIXED DATA WITHOUT SPECIFIC INSTRUCTION.
   Please set the EEPROM initial data according to the value in parenthesis ( ) before adjustment.
2) *2: CDL ADJUST = (7 for other model) and (9 for SMEF model)
3) *3: Adjust DRI-RC and DRI-GC as follows:

	other	SMEF
DRI-RC	25	27
DRI-GC	(DRI-GS)-7	(DRI-GS)-5

4) *4: S-COR ADJUST = 20
5) *5: ADJUST COLOUR OFFSET AFTER ADJUST SUB-COLOUR.
   COLOUR OFFSET (PAL) COL-OP : 8 -----> 14
   COLOUR OFFSET (SECAM) COL-OS : 8 -----> 14
   COLOUR OFFSET (NTSC358) COL-O3 : 4 -----> 10
   COLOUR OFFSET (NTSC443) COL-O4 : 4 -----> 10

INITIAL SETTING

1) Plaese set to MCL1.
2) After set the MCL1, please set the INITIAL SETTING for each model.

MCL1		
CH-NO	Fv (MHz)	SOUND SYS
0	41.10	
1	48.25	B/G
2	62.25	B/G
3	77.25	D/K
4	175.25	B/G
5	182.25	B/G
6	183.25	D/K
7	191.25	D/K
8	196.25	B/G
9	199.25	M
10	210.25	B/G
11	224.25	B/G
12	471.25	B/G
13	487.25	I
14	503.25	B/G
15	575.25	B/G
16	583.25	B/G
17	599.25	B/G
18	621.25	M
19	639.25	D/K
20	703.25	B/G
21	735.25	I
22	767.25	B/G
23	815.25	B/G
24	855.25	I
25	855.25	B/G
26	55.25	M
27	83.25	M
28	183.25	M
29	193.25	M
30	217.25	M
31	471.25	M
32	477.25	M
33	693.25	M
34	41.10	
35	112.25	B/G
36	168.25	B/G
37	41.10	
38	294.25	B/G
39	463.25	B/G
40	41.10	
41	647.25	B/G
42	663.25	B/G
43	679.25	B/G
44	174.95	B/G
45	175.55	B/G
46	41.10	
↓		
99	41.10	

INITIAL3: For Africa model
INITIAL4: For Middle-East model

*Note: After set the INITIAL SETTING, all channel Sound System are set to B/G

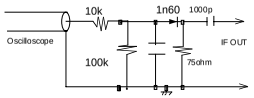
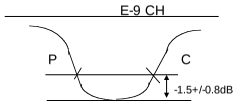
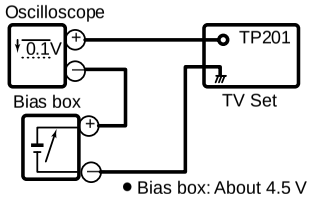
SHIPPING SETTING & CHECKING

(1) The following default data has been factory-set for the E^2PROM.

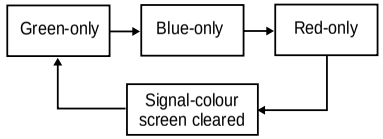
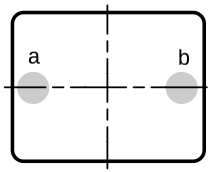
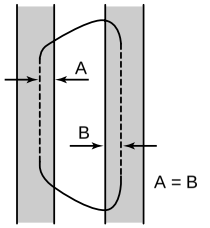
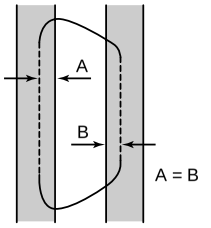
ITEMS	DATA SETTING
LAST PROGRAM/CHANNEL	1
FLASHBACK PROGARM/CH	1
DIGIT	1
C-SYSTEM	AUTO
S-SYSTEM	B/G
SKIP	OFF
AFC	ON
VOLUME	1
CONTRAST	60 (MAX)
COLOUR	0 (CENTER)
BRIGHTNESS	0 (CENTER)
TINT	0 (CENTER)
SHARPNESS	0 (CENTER)
WHITE TEMP	STANDARD
REMINDER TIMER	In-active, "--:--"
ON TIMER	In-active, "--:--"
OFF TIMER	In-active, "--:--"
LAST POWER	POWER-ON
LANGUAGE	*1
BLUE BACK MUTE	ON
HOTEL MODE	OFF
0 CHANNEL SKIP	ON
LAST TV/AV	TV

ADJUSTMENT PRECAUTION:
Make sure TV Set is in "Normal Condition" before switch to service mode for adjustment.

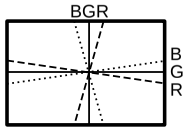
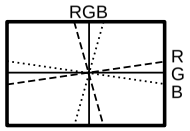
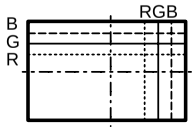
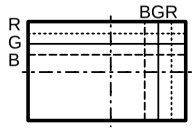
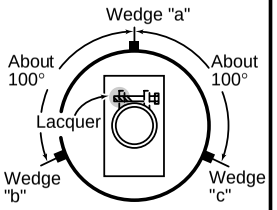
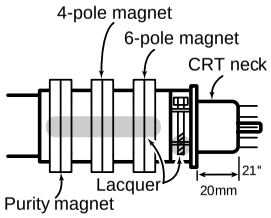
PIF ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**Tuner IFT (PRESET)**	1. Get the tuner ready to receive the CH. E - 9 signal,but with no signal input. Adjust the PLL data. 2. Connect the sweep generator's output cable to the tuner antenna. (RF SWEEP) 3. Adjust the sweep generator's to 80dBuV. 4. Connect the response lead (use LOW IMPEDANCE probe with wave detector ; see Fig.1) to the tuner's IF output terminal. (This terminal must have the probe alone connected). 5. Set the RF AGC to 0 - 6 V with no saturation with the waveform. 6. Adjust the tuner IF coil to obtain the waveform as shown in Fig. 2. Note: Be sure to keep the tuner cover in position during this adjustment.	 Fig.1  Fig.2
2	**RF-AGC TAKE OVER POINT ADJUSTMENT (I²C BUS CONTROL)**	1. Receive "PAL COLOUR BAR" signal. ● Signal Strength: 57 ± 1 dBμV (75 ohm open) 2. Connect the oscilloscope to TP201 (Tuner's AGC Terminal) as shown in Fig. 3.  ● Bias box: About 4.5 V Fig. 3 3. Call "AGC" mode in service mode. Adjust the "AGC" bus data to obtain the Tuner output pin drop 0.1V below maximum voltage. 4. Change the antenna input signal to 63~67dBμV, and make sure there is no noise. 5. Turn up the input signal to 90~95 dBμV to be sure that there is no cross modulation beat.	**Note: For the 50 ohm signal strength gauge, when not using 50/75 impedance adapter, signal strength is 52±1dBμV(75 ohm open), instead of 57±1dBμV (75 ohm open).** **Precaution: The loss of using impedance adapter**

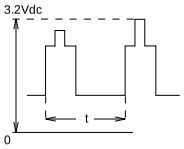
PURITY ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**PURITY ADJ.**	1. Receive the GREEN-ONLY signal. Adjust the beam current to about 700 μA. 2. Degauss the CRT enough with the degausing coil. 3. Maintain the purity magnet at the zero magnetic field and keep the static convergence roughly adjusted. 4. Observe the points a, b as shown in Fig. 4-1 through the microscope. Adjust the landing to the rank A requirements. 5. Orient the raster rotation to 0 eastward. 6. Tighten up the deflection coil screws. ● Tightening torque: 108 ± 20 N (11 ± 2 kgf) 7. Make sure the CRT corners landing meet the A rank requirements. If not, stick the magnet sheet to correct it. **Note: This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 700 μA.** * For the following colours press R/C RGB key to change. 	 Fig. 4-1  Fig. 4-2 Rank "A" (on the right of the CRT)  Fig. 4-3 Rank "A" (on the left of the CRT) * Press R/C RGB key for 1 second in NORMAL MODE, the colour will change to RGB mono colour mode. The TEXT Key "R. G. Cy" Key can be directly use to change to other colours screen.

CONVERGENCE ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**CONVERGENC ADJ. (To be done after the purity adjustment.**	1. Receive the "Crosshatch Pattern" signal. 2. Using the remote controller, call NORMAL mode. **STATIC CONVERGENCE** 1. Turn the 4-pole magnet to a proper opening angle in order to superpose the blue and red colours. 2. Turn the 6-pole magnet to a proper opening angle in order to superpose the green colour over the blue and red colours. **DYNAMIC CONVERGENCE** 1. Adjust the convergence on the fringes of the screen in the following steps. a) Fig. 5-1: Drive the wedge at point "a" and swing the deflection coil upward. b) Fig. 5-2: Drive the wedge at points "b" and "c" and swing the deflection coil downward. c) Fig. 5-3: Drive the "c" wedge deeper and swing the deflection coil rightward. d) Fig. 5-4: Drive the "b" wedge deeper and swing the deflection coil leftward. 2. Fix all the wedges on the CRT and apply glass tape over them. 3. Apply lacquer to the deflection yoke lock screw, magnet unit (purity, 4-pole, 6-pole magnets) and magnet unit lock screw. Finally received the Red-only and Blue-only signals to make sure there is no other colours on the screen.	 Fig. 5-1  Fig. 5-2  Fig. 5-3  Fig. 5-4  

CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**CRT CUTOFF ADJUSTMENT (I²C BUS CONTROL)**	Remark 1. Before CRT cutoff adjustment, SUB-BRIGHT, DRI-RS/RW/RC, DRI-GS/GW/GC, DRI-BS/BW/BC, CUT-R and CUT-G must be INITIAL DATA. 2. CRT Cutoff adjustment must be done inside a dark room. 1. Switch TV to VIDEO mode,BLUE BACK OFF, with NO VIDEO signal. 2. Press R/C to set Picture Normal condition. 3. First, off the screen by adjust screen variable resistor. *4. Next, checking AKB circuit function by slowly increase screen variable resistor until colour raster suddenly on and off (AKB start function). 5. Then continue adjust until retrace line appear. 6. Finally, slowly decrease the screen variable resistor until screen retrace line cut off. (Not Raster) Note : Must confirm the AKB function in set before continue the next adjustment.	*Alternative Procedure (1) Step (1), (2), (3) and (4) are same as beside procedure. (2) Then continue adjust until retrace line appear and make sure the colour appear whether red, green or blue. (3) Connect the oscilloscope to related test points as below which is based on colour appear at (2) RED = TP47R, GREEN = TP47G, BLUE = TP47B. (4) Then adjust Screen VR until the tip of signal reach 3.2Vdc. 
2	**SUB-BRIGHTNESS ADJUSMENT (I²C BUS CONTROL)**	1. Call " SUB-BRI" in service mode. (Receive Crosshatch pattern with 5 black level windows) 2. Adjust the " SUB BRIGHT " bus data in order that the line 1and 2 have the same darkness wherelse line 3 is one step (data) brighter than line 2. Finally data minus 1 to make line 1, 2, and 3 are in same level (darkness).	1 Line 3 is one step (data) brighter than line 2 2
3	**WHITE BALANCE SERVICE MODE ADJ. (I²C BUS CONTROL)**	1. Receive the "WHITE" pattern with BURST signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between TP602 (-) TP603 (+). 4. Check Beam current should be around 1100 µA. 5. Set it to service mode and adjust the DRI-GS, & DRI-BS data to have a colour temperature of 12300°K or 18000°K (white). * Note . 6. Receive "WHITE" pattern, WITH BURST signal, and set BRIGHTNESS Y by generator, to **10 cd/m2 (MINOLTA CA-100) by reducing LUMINATE Y signal. 7. Adjust "CUT-R" & "CUT-G" to get desired colour temperature #. Then go back NORMAL mode (HIGH BRIGHT**) to check colour temperature. If out of range, back to (1). **Note: This adjustment must be done after warming up the unit for 30 minutes or longer with a beam current over 700µA.** * Adjust DRI-GC/GW, DRI-BC/BW as following data, after finishing DRI-BS and DRI-GS data adjustment. DRI-RW = 32 (FIXED), DRI-RS = 32 (FIXED) DRI-BC = "DRI-BS" (For 12300°K and 18000°K Condition)	# 12300°K X : 0.272 Y : 0.275 # 18000°K X : 0.255 Y : 0.255 (MINOLTA COLOUR ANALYZER CA-100) *Note: Above Data can be UP/DOWN by Volume key. LOW HIGH 10cd/m2 120cd/m2 * 12300°K DRI-GW="DRI-GS"-7 DRI-BW="DRI-BS"-7 DRI-GC="DRI-GS"-5 DRI-RC=25 * 18000°K DRI-GW="DRI-GS"-7 DRI-BW="DRI-BS"-7 DRI-GC="DRI-GS"-5 DRI-RC=27

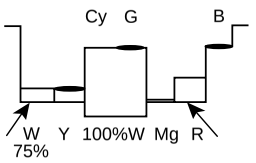
CRT CUT-OFF, BACKGROUND AND SUB-CONTRAST ADJUSTMENT (Continued)

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
4	**Max beam check**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Connect the DC miliammeter between TP603 (+) & TP602 (–). (Full Scale: 3 mA Range) 4. Beam current must be within 1100 ± 100 μA.	

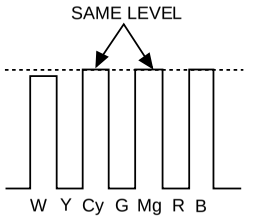
HORIZONTAL AND VERTICAL DEFLECTION LOOP ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**V-SLOPE (I²C BUS CONTROL)**	1. Receive Monoscope Pattern Signal. 2. Call the "V-LIN" mode. 3. Increase or decrease "V-LIN" by Volume key till the horizontal line in the center of monoscope is just at the position where the blanking starts.	
2	**V-SHIFT-50 (I²C BUS CONTROL)**	1. Call the "V-CENT" mode. 2. Increase or decrease "V-CENT" by Volume key till the picture is centered.	
3	**V-AMP50 (I²C BUS CONTROL)**	1. Call the "V-AMP" mode. 2. Increase or decrease "V-AMP" by Volume key to set overscan of 9.5% typical. Adjustment Spec 9.5% range +1% -0%.	
4	**H-SHIFT (50) (H-CENTER)**	1. Call the "H-CENT" mode. 2. Increase or decrease "H-CENT" by Volume key to center the picture horizontal.	
5	**S-CORRECTION (I²C BUS CONTROL)**	1. SET DATA TO 20. * Check the E-5 CH Monoscope Pattern then re-adjust V-Slope, V-Shift and V-Amp to makesure adjustment is in acceptable Ring-Shaped.	
6	**SUB-SHARPNESS**	1. SET DATA TO 20.	
1	**Focus**	1. Receive the "Monoscope Pattern" signal. 2. Press R/C to set Picture NORMAL condition. 3. Adjust the focus control to get the best focusing.	

PAL CHROMA ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**SUB COLOUR (I²C BUS CONTROL)**	1. Receive the "PAL Colour Bar" signal. 2. Press R/C to set Picture Normal condition. 3. Connect the oscilloscope to Red cathode(0882 Chathode). ● Range : 20 V/div. (AC) (Using 10:1 probe) ● Sweep time : 10 μsec/div. 4. Using the R/C call "SUB COL" in SERVICE mode. Adjust SUB COLOUR bus data, so that the 75% White & Red portions of PAL Color Bar be at the same level shown as **Fig. 1-1**. * Before adjust SUB-COL, make sure COL-OP=8,COL-OS=8,COL-O3=4, COL-O4=4. After adjust SUB-COL, set COL-OP=14,COL-OS=14,COL-O3=10, COL-O4=10. 5. Clear the SERVICE mode.	 Fig. 1-1

NTSC CHROMA ADJUSTMENT

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**SUB-TINT (I²C BUS CONTROL)**	1. Receive the "NTSC 3.58 Colour Bar" signal thru AV in. 2. Connect the oscilloscope to TP47B (P882 pin 5) BLUE-OUT. ● Range : 100mV/div. (AC)(Use Probe 10:1) ● Sweep time : 10 μsec/div. 3. Call the "SUB-TINT" mode in service mode. Adjust the "SUB-TINT" bus data to obtain the waveform shown as Fig. 1-1. 4. Clear the SERVICE mode.	 Fig. 1-1

PROTECTOR OPERATION CHECKING

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**BEAM PROTECTOR**	1. Receive "Monoscope Pattern" signal. 2. Set CONTRAST MAX. 3. Set BRIGHT MAX. 4. During the Collector & Emitter of Q883/5/7 short, make sure the protector ON and switch to standby mode.	* Select one of Q883/5/7 to do each short test.
2	**H. V PROTECTOR**	1. Receive "Monoscope Pattern" signal. 2. Connect output of Bias Box to D603 cathode (R610 side). 3. Set voltage of Bias Box to 18V and make sure the protector is not work. 4. Set voltage of Bias Box to 27V, and make sure the protector is work.	
3	**Other protectors**	1. Once finish rectified Electrolytic Capacitor short testing in +B line, check all possible damaged components on +B line. (Use random selected set for inspection)	

A/V INPUT AND OUTPUT CHECKING

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**VIDEO AND AUDIO OUTPUT CHECK**	1. Receive the "PAL Color Bar" signal (100% White Color Bar, Sound 400 Hz 100% Mod). 2. Terminate the Video output with a 75 ohm impedance. Make sure the output is as specified (1.0 Vp-p ±3 dB). 3. Terminate the Audio output with a 10k ohm impedance. Make sure the O/P is as specified (1.76 Vp-p ±3 dB).	
2	**VIDEO AND AUDIO INPUT CHECK**	1. Using the TV/AV key on the remote controller, make sure that the modes change in order of TV, AV & TV again and the video & audio output are according to the input terminal for each mode.If connect input to Front and Rear AV terminal, input terminal of Front AV will be selected.	

FUNCTION OPERATION CHECKING (VIDEO AND AUDIO)

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
1	**CONTRAST key**	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select CONTRAST. 3. Press Volume Up/Down key to check whether the CONTRAST effect is OK or not.	
2	**COLOUR key**	1. Receive "Color Bar" signal. 2. Set P-Mode to select COLOUR. 3. Press Volume Up/Down key to check whether the COLOUR effect is OK or not.	
3	**BRIGHTNESS key**	1. Receive "Monoscope Pattern" signal. 2. Set P-Mode to select BRIGHTNESS. 3. Press Volume Up/Down key to check whether the BRIGHTNESS effect is OK or not.	
4	**TINT key**	1. Receive the "NTSC Colour Bar" signal thru AV in. 2. Set P-Mode to select TINT. 3. Press Volume Up/Down key to check TINT, UP for GREEN direction and DOWN for PURPLE direction whether is OK or not.	
5	**SHARPNESS Key**	1. Receive "Monoscope Pattern" signal. 2. Set P-mode to select SHARPNESS. 3. Press Volume Up/Down key to check whether the SHARPNESS effect is OK or not.	
6	**CH DISPLAY COLOUR**	1. All Ch (1~99) will have an OSD display of the channel number in green colour under AFT ON condition.	
7	**NORMAL Key**	1. Once in PICTURE Mode, and theNORMAL key is pressed, all the settings will be present to normal setting. (Normal setting value for every mode). ● CONTRAST : MAX ● COLOUR : CENTER ● BRIGHTNESS : CENTER ● TINT : CENTER ● SHARPNESS : CENTER	**Notes:If nothing is display mean contrast, colour, bright, tint, sharpness are all in normal setting.**
8	**WHITE TEMP**	1. Receive "Monoscope Pattern" signal. 2. Set FUNCTION to select WHITE TEMP. 3. Press Volume Up/Down key to check WHITE TEMP Option, STANDARD: NORMAL SETTING, WARM for more REDDISH direction changing, COOL for more BLUISH direction changing.	

FUNCTION OPERATION CHECKING (VIDEO AND AUDIO)

(Continued)

No.	Adjusting point	Adjusting procedure/conditions	Waveform and others
9	**COLOUR SYSTEM**	1. Receive the "PAL COLOUR BAR" signal, press the COLOUR SYSTEM key to select modes except PAL, check the COLOUR is not working properly. Then, select the "PAL" mode. Check again its colour so that it is working properly. 2. Receive "SECAM COLOUR BAR" signal, press COLOUR SYSTEM key to select modes except SECAM, check the COLOUR is not working properly. Then, select the "SECAM" mode. Check again its colour so that it is working properly. 3. Receive "NTSC 4.43 " signal thru AV, press COLOUR SYSTEM key to select modes except N4.43, check the COLOUR is not working properly. Then, select the "NTSC 4.43" mode. Check again its colour so that it is working properly. 4. Receive "NTSC 4.43/3.58 COLOUR BAR" signal thru AV, press COLOUR SYSTEM key to select modes except N4.43/3.58, check the COLOUR is not working properly. Then, select the "NTSC 4.43/3.58" mode. Check again its colour so that it is working properly.	
10	**SOUND SYSTEM**	1. Receive "PAL-D/K" signal, press the "SOUND SYSTEM" to select B/G, I. Check the sound output is not working properly. Select D/K and check the sound output to make sure it is working properly. 2. Receive "PAL-I" signal, press the "SOUND SYSTEM" to select B/G, D/K. Check the sound output is not working properly. Select I and check the sound output to make sure it is working properly. 3. Receive "PAL-B/G" signal, press the "SOUND SYSTEM"to select I, D/K. Check the sound output is not working properly. Select B/G and check the sound output to make sure it is working properly.	
11	**NOISE MUTE CHECKING**	1. Receive "PAL COLOUR BAR" signal. 2. Turn up the volume control to maximum, make sure the sound is heard from the speakers. Then put the unit in no signal state. 3. Check the sound mute is effective. 4. Finally turn sound level of CTV to minimum.	
12	**OSD LANGUAGE QUANTITY CHECK**	Check OSD LANGUAGE quantity and type as English, Russian, Chinese, French, Arabic and Malay.	

MEMORY MAP

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
00	PASS WORD								55	00-FF							
01	PASS WORD								4F	00-FF							
02	PASS WORD								43	00-FF							
03	PASS WORD								A1	00-FF							
04																	
05																	
06	AGC TAKE-OVER								0E	00-3F							
07	V-SLOPE								20	00-3F							
08	V-AMPLITUDE								20	00-3F							
09	V-CENTER								20	00-3F							
0A	H-CENTER								20	00-3F							
0B	H-SIZE								20	00-3F							
0C	EW-PARALLELOGRAM								20	00-3F							
0D	EW-PARABOLA/WIDTH								20	00-3F							
0E	EW-UPPER CORNER								20	00-3F							
0F	EW-LOWER CORNER								20	00-3F							
10	EW-TRAPEZIUM								20	00-3F							
11	HORIZONTAL-BOW								20	00-3F							
12	S-CORRECTION								00	00-3F							
13																	
14																	
15																	
16	DRIVE-R (STANDARD)								20	00-3F							
17	DRIVE-G (STANDARD)								20	00-3F							
18	DRIVE-B (STANDARD)								20	00-3F							
19	DRIVE-R (WARM)								20	00-3F							
1A	DRIVE-G (WARM)								20	00-3F							
1B	DRIVE-B (WARM)								20	00-3F							
1C	DRIVE-R (COOL)								19	00-3F							
1D	DRIVE-G (COOL)								20	00-3F							
1E	DRIVE-B (COOL)								20	00-3F							
1F																	
20																	
21																	
22	SUB-VOLUME								3F	00-3F							
23	SUB-CONTRAST								3F	00-3F							
24	SUB-COLOUR								20	00-3F							
25	SUB-BRIGHTNESS								20	00-3F							
26	SUB-TINT								20	00-3F							
27	SUB-SHARPNESS								20	00-3F							
28	HTL-VOLUME								20	00-3F							
29	HTL-POSITION								FF	00-FF							
2A																	
2B																	
2C																	
2D	OSD-REFERENCE								0F	00-0F							
2E	CUTOFF LEVEL -OFFSET R								20	00-3F							(1) 20th August 2001: Change of range & default.
2F	CUTOFF LEVEL -OFFSET G								20	00-3F							
30	CATHODE DRIVE LEVEL								00	00-0F							
31	Y-DELAY (TV PAL)								0C	00-0F							
32	Y-DELAY (TV SECAM)								0F	00-0F							
33	Y-DELAY (TV N358)								0C	00-0F							
34	Y-DELAY (TV N443)								0C	00-0F							
35	Y-DELAY (TV BW)								0C	00-0F							
36	Y-DELAY (AV PAL)								0C	00-0F							
37	Y-DELAY (AV SECAM)								0F	00-0F							
38	Y-DELAY (AV N358)								0C	00-0F							
39	Y-DELAY (AV N443)								0C	00-0F							
3A	Y-DELAY (AV BW)								0C	00-0F							
3B	COLOUR-OFFSET (PAL)								08	00-0F							
3C	COLOUR-OFFSET (SECAM)								08	00-0F							
3D	COLOUR-OFFSET (N358)								04	00-0F							
3E	COLOUR-OFFSET (N443)								04	00-0F							
3F	SHARPNESS-OFFSET (PAL)								08	00-0F							
	MODEL									MODEL							
	LETTER NO.									LETTER NO.							

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
40	SHARPNESS-OFFSET (SECAM)								04	00-0F							
41	SHARPNESS-OFFSET (N358)								0C	00-0F							
42	SHARPNESS-OFFSET (N443)								08	00-0F							
43																	
44	FCO	ACL	OSO	EHT	EVG	FFI	AVL	BKS	1B	00-FF							
45	SECAM	N443	N358	PB-SECAM	BG	I	DK	M	DE	00-FF							
46	SM1	SM0	FMWS	AV	BTSC	HTL	VMC	VMI	53	00-FF							
47	HP2	FSL	RUS	FRA	CHN	MLY	ARB	THA	3E	00-FF							
48	FOB-AV	FOA-AV	FOB-FE	FOA-FE	AGC1	AGC0	BIL	CPT	C4	00-FF							
49						NDF	MSA	LED-F	00	00-03							(1) 20th August 2001: Added 3 new items.
4A																	
4B																	
4C	VOLUME								01	00-3C							
4D	CONTRAST								3C	00-3C							
4E	COLOUR								1E	00-3C							
4F	BRIGHTNESS								1E	00-3C							
50	TINT								1E	00-3C							
51	SHARPNESS								1E	00-3C							
52																	
53																	
54																	
55	POSITION/AV1/AV2								01	00-FF							
56	FAV-POS A								0A	00-FF							
57	FAV-POS B								14	00-FF							
58	FAV-POS C								1E	00-FF							
59	FAV-POS D								28	00-FF							
5A																	
5B																	
5C	LAST POWER MODE								00	00-01							
5D	WHITE-TEMP								00	00-02							
5E	BLUE BACK								00	00-01							
5F	LANGUAGE								00	00-07							
60	LAST DIGIT MODE (1 OR 2)								00	00-01							
61																	
62	SKIP 0	SKIP 1	SKIP 2	SKIP 3	SKIP 4	SKIP 5	SKIP 6	SKIP 7	80	00-FF							
63	SKIP 8	SKIP 9	SKIP 10	SKIP 11	SKIP 12	SKIP 13	SKIP 14	SKIP 15	00	00-FF							
64	SKIP 16	SKIP 17	SKIP 18	SKIP 19	SKIP 20	SKIP 21	SKIP 22	SKIP 23	00	00-FF							
65	SKIP 24	SKIP 25	SKIP 26	SKIP 27	SKIP 28	SKIP 29	SKIP 30	SKIP 31	00	00-FF							
66	SKIP 32	SKIP 33	SKIP 34	SKIP 35	SKIP 36	SKIP 37	SKIP 38	SKIP 39	00	00-FF							
67	SKIP 40	SKIP 41	SKIP 42	SKIP 43	SKIP 44	SKIP 45	SKIP 46	SKIP 47	00	00-FF							
68	SKIP 48	SKIP 49	SKIP 50	SKIP 51	SKIP 52	SKIP 53	SKIP 54	SKIP 55	00	00-FF							
69	SKIP 56	SKIP 57	SKIP 58	SKIP 59	SKIP 60	SKIP 61	SKIP 62	SKIP 63	00	00-FF							
6A	SKIP 64	SKIP 65	SKIP 66	SKIP 67	SKIP 68	SKIP 69	SKIP 70	SKIP 71	00	00-FF							
6B	SKIP 72	SKIP 73	SKIP 74	SKIP 75	SKIP 76	SKIP 77	SKIP 78	SKIP 79	00	00-FF							
6C	SKIP 80	SKIP 81	SKIP 82	SKIP 83	SKIP 84	SKIP 85	SKIP 86	SKIP 87	00	00-FF							
6D	SKIP 88	SKIP 89	SKIP 90	SKIP 91	SKIP 92	SKIP 93	SKIP 94	SKIP 95	00	00-FF							
6E	SKIP 96	SKIP 97	SKIP 98	SKIP 99					00	00-FF							
6F																	
70																	
71																	
72																	
73																	
74	TUNING FREQUANCY (HIGHER PART)										S-SYS						POS 0
75	TUNING FREQUANCY (LOWER PART)										000:BG						
76	S-SYS			AFT	(auto)			C-SYS			001:I						
77	TUNING FREQUANCY (HIGHER PART)										010:DK						POS 1
78	TUNING FREQUANCY (LOWER PART)										011:M						
79	S-SYS			AFT	(auto)			C-SYS									
7A	TUNING FREQUANCY (HIGHER PART)										AFT						POS 2
7B	TUNING FREQUANCY (LOWER PART)										0:OFF						
7C	S-SYS			AFT	(auto)			C-SYS			1:ON						
7D	TUNING FREQUANCY (HIGHER PART)																POS 3
7E	TUNING FREQUANCY (LOWER PART)																
7F	S-SYS			AFT	(auto)			C-SYS									
	MODEL									MODEL							
	LETTER NO.									LETTER NO.							

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
80	TUNING FREQUANCY (HIGHER PART)																POS 4
81	TUNING FREQUANCY (LOWER PART)																
82		S-SYS		AFT	(auto)			C-SYS									
83	TUNING FREQUANCY (HIGHER PART)																POS 5
84	TUNING FREQUANCY (LOWER PART)																
85		S-SYS		AFT	(auto)			C-SYS									
86	TUNING FREQUANCY (HIGHER PART)																POS 6
87	TUNING FREQUANCY (LOWER PART)																
88		S-SYS		AFT	(auto)			C-SYS									
89	TUNING FREQUANCY (HIGHER PART)																POS 7
8A	TUNING FREQUANCY (LOWER PART)																
8B		S-SYS		AFT	(auto)			C-SYS									
8C	TUNING FREQUANCY (HIGHER PART)																POS 8
8D	TUNING FREQUANCY (LOWER PART)																
8E		S-SYS		AFT	(auto)			C-SYS									
8F	TUNING FREQUANCY (HIGHER PART)																POS 9
90	TUNING FREQUANCY (LOWER PART)																
91		S-SYS		AFT	(auto)			C-SYS									
92	TUNING FREQUANCY (HIGHER PART)																POS 10
93	TUNING FREQUANCY (LOWER PART)																
94		S-SYS		AFT	(auto)			C-SYS									
95	TUNING FREQUANCY (HIGHER PART)																POS 11
96	TUNING FREQUANCY (LOWER PART)																
97		S-SYS		AFT	(auto)			C-SYS									
98	TUNING FREQUANCY (HIGHER PART)																POS 12
99	TUNING FREQUANCY (LOWER PART)																
9A		S-SYS		AFT	(auto)			C-SYS									
9B	TUNING FREQUANCY (HIGHER PART)																POS 13
9C	TUNING FREQUANCY (LOWER PART)																
9D		S-SYS		AFT	(auto)			C-SYS									
9E	TUNING FREQUANCY (HIGHER PART)																POS 14
9F	TUNING FREQUANCY (LOWER PART)																
A0		S-SYS		AFT	(auto)			C-SYS									
A1	TUNING FREQUANCY (HIGHER PART)																POS 15
A2	TUNING FREQUANCY (LOWER PART)																
A3		S-SYS		AFT	(auto)			C-SYS									
A4	TUNING FREQUANCY (HIGHER PART)																POS 16
A5	TUNING FREQUANCY (LOWER PART)																
A6		S-SYS		AFT	(auto)			C-SYS									
A7	TUNING FREQUANCY (HIGHER PART)																POS 17
A8	TUNING FREQUANCY (LOWER PART)																
A9		S-SYS		AFT	(auto)			C-SYS									
AA	TUNING FREQUANCY (HIGHER PART)																POS 18
AB	TUNING FREQUANCY (LOWER PART)																
AC		S-SYS		AFT	(auto)			C-SYS									
AD	TUNING FREQUANCY (HIGHER PART)																POS 19
AE	TUNING FREQUANCY (LOWER PART)																
AF		S-SYS		AFT	(auto)			C-SYS									
B0	TUNING FREQUANCY (HIGHER PART)																POS 20
B1	TUNING FREQUANCY (LOWER PART)																
B2		S-SYS		AFT	(auto)			C-SYS									
B3	TUNING FREQUANCY (HIGHER PART)																POS 21
B4	TUNING FREQUANCY (LOWER PART)																
B5		S-SYS		AFT	(auto)			C-SYS									
B6	TUNING FREQUANCY (HIGHER PART)																POS 22
B7	TUNING FREQUANCY (LOWER PART)																
B8		S-SYS		AFT	(auto)			C-SYS									
B9	TUNING FREQUANCY (HIGHER PART)																POS 23
BA	TUNING FREQUANCY (LOWER PART)																
BB		S-SYS		AFT	(auto)			C-SYS									
BC	TUNING FREQUANCY (HIGHER PART)																POS 24
BD	TUNING FREQUANCY (LOWER PART)																
BE		S-SYS		AFT	(auto)			C-SYS									
BF	TUNING FREQUANCY (HIGHER PART)																POS 25
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
C0	TUNING FREQUANCY (LOWER PART)																POS 25
C1		S-SYS		AFT	(auto)			C-SYS									
C2	TUNING FREQUANCY (HIGHER PART)																POS 26
C3	TUNING FREQUANCY (LOWER PART)																
C4		S-SYS		AFT	(auto)			C-SYS									
C5	TUNING FREQUANCY (HIGHER PART)																POS 27
C6	TUNING FREQUANCY (LOWER PART)																
C7		S-SYS		AFT	(auto)			C-SYS									
C8	TUNING FREQUANCY (HIGHER PART)																POS 28
C9	TUNING FREQUANCY (LOWER PART)																
CA		S-SYS		AFT	(auto)			C-SYS									
CB	TUNING FREQUANCY (HIGHER PART)																POS 29
CC	TUNING FREQUANCY (LOWER PART)																
CD		S-SYS		AFT	(auto)			C-SYS									
CE	TUNING FREQUANCY (HIGHER PART)																POS 30
CF	TUNING FREQUANCY (LOWER PART)																
D0		S-SYS		AFT	(auto)			C-SYS									
D1	TUNING FREQUANCY (HIGHER PART)																POS 31
D2	TUNING FREQUANCY (LOWER PART)																
D3		S-SYS		AFT	(auto)			C-SYS									
D4	TUNING FREQUANCY (HIGHER PART)																POS 32
D5	TUNING FREQUANCY (LOWER PART)																
D6		S-SYS		AFT	(auto)			C-SYS									
D7	TUNING FREQUANCY (HIGHER PART)																POS 33
D8	TUNING FREQUANCY (LOWER PART)																
D9		S-SYS		AFT	(auto)			C-SYS									
DA	TUNING FREQUANCY (HIGHER PART)																POS 34
DB	TUNING FREQUANCY (LOWER PART)																
DC		S-SYS		AFT	(auto)			C-SYS									
DD	TUNING FREQUANCY (HIGHER PART)																POS 35
DE	TUNING FREQUANCY (LOWER PART)																
DF		S-SYS		AFT	(auto)			C-SYS									
E0	TUNING FREQUANCY (HIGHER PART)																POS 36
E1	TUNING FREQUANCY (LOWER PART)																
E2		S-SYS		AFT	(auto)			C-SYS									
E3	TUNING FREQUANCY (HIGHER PART)																POS 37
E4	TUNING FREQUANCY (LOWER PART)																
E5		S-SYS		AFT	(auto)			C-SYS									
E6	TUNING FREQUANCY (HIGHER PART)																POS 38
E7	TUNING FREQUANCY (LOWER PART)																
E8		S-SYS		AFT	(auto)			C-SYS									
E9	TUNING FREQUANCY (HIGHER PART)																POS 39
EA	TUNING FREQUANCY (LOWER PART)																
EB		S-SYS		AFT	(auto)			C-SYS									
EC	TUNING FREQUANCY (HIGHER PART)																POS 40
ED	TUNING FREQUANCY (LOWER PART)																
EE		S-SYS		AFT	(auto)			C-SYS									
EF	TUNING FREQUANCY (HIGHER PART)																POS 41
F0	TUNING FREQUANCY (LOWER PART)																
F1		S-SYS		AFT	(auto)			C-SYS									
F2	TUNING FREQUANCY (HIGHER PART)																POS 42
F3	TUNING FREQUANCY (LOWER PART)																
F4		S-SYS		AFT	(auto)			C-SYS									
F5	TUNING FREQUANCY (HIGHER PART)																POS 43
F6	TUNING FREQUANCY (LOWER PART)																
F7		S-SYS		AFT	(auto)			C-SYS									
F8	TUNING FREQUANCY (HIGHER PART)																POS 44
F9	TUNING FREQUANCY (LOWER PART)																
FA		S-SYS		AFT	(auto)			C-SYS									
FB	TUNING FREQUANCY (HIGHER PART)																POS 45
FC	TUNING FREQUANCY (LOWER PART)																
FD		S-SYS		AFT	(auto)			C-SYS									
FE	TUNING FREQUANCY (HIGHER PART)																POS 46
FF	TUNING FREQUANCY (LOWER PART)																
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
100		S-SYS		AFT	(auto)			C-SYS									POS 46
101				TUNING FREQUANCY (HIGHER PART)													POS 47
102				TUNING FREQUANCY (LOWER PART)													
103		S-SYS		AFT	(auto)			C-SYS									
104				TUNING FREQUANCY (HIGHER PART)													POS 48
105				TUNING FREQUANCY (LOWER PART)													
106		S-SYS		AFT	(auto)			C-SYS									
107				TUNING FREQUANCY (HIGHER PART)													POS 49
108				TUNING FREQUANCY (LOWER PART)													
109		S-SYS		AFT	(auto)			C-SYS									
10A				TUNING FREQUANCY (HIGHER PART)													POS 50
10B				TUNING FREQUANCY (LOWER PART)													
10C		S-SYS		AFT	(auto)			C-SYS									
10D				TUNING FREQUANCY (HIGHER PART)													POS 51
10E				TUNING FREQUANCY (LOWER PART)													
10F		S-SYS		AFT	(auto)			C-SYS									
110				TUNING FREQUANCY (HIGHER PART)													POS 52
111				TUNING FREQUANCY (LOWER PART)													
112		S-SYS		AFT	(auto)			C-SYS									
113				TUNING FREQUANCY (HIGHER PART)													POS 53
114				TUNING FREQUANCY (LOWER PART)													
115		S-SYS		AFT	(auto)			C-SYS									
116				TUNING FREQUANCY (HIGHER PART)													POS 54
117				TUNING FREQUANCY (LOWER PART)													
118		S-SYS		AFT	(auto)			C-SYS									
119				TUNING FREQUANCY (HIGHER PART)													POS 55
11A				TUNING FREQUANCY (LOWER PART)													
11B		S-SYS		AFT	(auto)			C-SYS									
11C				TUNING FREQUANCY (HIGHER PART)													POS 56
11D				TUNING FREQUANCY (LOWER PART)													
11E		S-SYS		AFT	(auto)			C-SYS									
11F				TUNING FREQUANCY (HIGHER PART)													POS 57
120				TUNING FREQUANCY (LOWER PART)													
121		S-SYS		AFT	(auto)			C-SYS									
122				TUNING FREQUANCY (HIGHER PART)													POS 58
123				TUNING FREQUANCY (LOWER PART)													
124		S-SYS		AFT	(auto)			C-SYS									
125				TUNING FREQUANCY (HIGHER PART)													POS 59
126				TUNING FREQUANCY (LOWER PART)													
127		S-SYS		AFT	(auto)			C-SYS									
128				TUNING FREQUANCY (HIGHER PART)													POS 60
129				TUNING FREQUANCY (LOWER PART)													
12A		S-SYS		AFT	(auto)			C-SYS									
12B				TUNING FREQUANCY (HIGHER PART)													POS 61
12C				TUNING FREQUANCY (LOWER PART)													
12D		S-SYS		AFT	(auto)			C-SYS									
12E				TUNING FREQUANCY (HIGHER PART)													POS 62
12F				TUNING FREQUANCY (LOWER PART)													
130		S-SYS		AFT	(auto)			C-SYS									
131				TUNING FREQUANCY (HIGHER PART)													POS 63
132				TUNING FREQUANCY (LOWER PART)													
133		S-SYS		AFT	(auto)			C-SYS									
134				TUNING FREQUANCY (HIGHER PART)													POS 64
135				TUNING FREQUANCY (LOWER PART)													
136		S-SYS		AFT	(auto)			C-SYS									
137				TUNING FREQUANCY (HIGHER PART)													POS 65
138				TUNING FREQUANCY (LOWER PART)													
139		S-SYS		AFT	(auto)			C-SYS									
13A				TUNING FREQUANCY (HIGHER PART)													POS 66
13B				TUNING FREQUANCY (LOWER PART)													
13C		S-SYS		AFT	(auto)			C-SYS									
13D				TUNING FREQUANCY (HIGHER PART)													POS 67
13E				TUNING FREQUANCY (LOWER PART)													
13F		S-SYS		AFT	(auto)			C-SYS									
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
140				TUNING FREQUANCY (HIGHER PART)													POS 68
141				TUNING FREQUANCY (LOWER PART)													
142		S-SYS		AFT	(auto)			C-SYS									
143				TUNING FREQUANCY (HIGHER PART)													POS 69
144				TUNING FREQUANCY (LOWER PART)													
145		S-SYS		AFT	(auto)			C-SYS									
146				TUNING FREQUANCY (HIGHER PART)													POS 70
147				TUNING FREQUANCY (LOWER PART)													
148		S-SYS		AFT	(auto)			C-SYS									
149				TUNING FREQUANCY (HIGHER PART)													POS 71
14A				TUNING FREQUANCY (LOWER PART)													
14B		S-SYS		AFT	(auto)			C-SYS									
14C				TUNING FREQUANCY (HIGHER PART)													POS 72
14D				TUNING FREQUANCY (LOWER PART)													
14E		S-SYS		AFT	(auto)			C-SYS									
14F				TUNING FREQUANCY (HIGHER PART)													POS 73
150				TUNING FREQUANCY (LOWER PART)													
151		S-SYS		AFT	(auto)			C-SYS									
152				TUNING FREQUANCY (HIGHER PART)													POS 74
153				TUNING FREQUANCY (LOWER PART)													
154		S-SYS		AFT	(auto)			C-SYS									
155				TUNING FREQUANCY (HIGHER PART)													POS 75
156				TUNING FREQUANCY (LOWER PART)													
157		S-SYS		AFT	(auto)			C-SYS									
158				TUNING FREQUANCY (HIGHER PART)													POS 76
159				TUNING FREQUANCY (LOWER PART)													
15A		S-SYS		AFT	(auto)			C-SYS									
15B				TUNING FREQUANCY (HIGHER PART)													POS 77
15C				TUNING FREQUANCY (LOWER PART)													
15D		S-SYS		AFT	(auto)			C-SYS									
15E				TUNING FREQUANCY (HIGHER PART)													POS 78
15F				TUNING FREQUANCY (LOWER PART)													
160		S-SYS		AFT	(auto)			C-SYS									
161				TUNING FREQUANCY (HIGHER PART)													POS 79
162				TUNING FREQUANCY (LOWER PART)													
163		S-SYS		AFT	(auto)			C-SYS									
164				TUNING FREQUANCY (HIGHER PART)													POS 80
165				TUNING FREQUANCY (LOWER PART)													
166		S-SYS		AFT	(auto)			C-SYS									
167				TUNING FREQUANCY (HIGHER PART)													POS 81
168				TUNING FREQUANCY (LOWER PART)													
169		S-SYS		AFT	(auto)			C-SYS									
16A				TUNING FREQUANCY (HIGHER PART)													POS 82
16B				TUNING FREQUANCY (LOWER PART)													
16C		S-SYS		AFT	(auto)			C-SYS									
16D				TUNING FREQUANCY (HIGHER PART)													POS 83
16E				TUNING FREQUANCY (LOWER PART)													
16F		S-SYS		AFT	(auto)			C-SYS									
170				TUNING FREQUANCY (HIGHER PART)													POS 84
171				TUNING FREQUANCY (LOWER PART)													
172		S-SYS		AFT	(auto)			C-SYS									
173				TUNING FREQUANCY (HIGHER PART)													POS 85
174				TUNING FREQUANCY (LOWER PART)													
175		S-SYS		AFT	(auto)			C-SYS									
176				TUNING FREQUANCY (HIGHER PART)													POS 86
177				TUNING FREQUANCY (LOWER PART)													
178		S-SYS		AFT	(auto)			C-SYS									
179				TUNING FREQUANCY (HIGHER PART)													POS 87
17A				TUNING FREQUANCY (LOWER PART)													
17B		S-SYS		AFT	(auto)			C-SYS									
17C				TUNING FREQUANCY (HIGHER PART)													POS 88
17D				TUNING FREQUANCY (LOWER PART)													
17E		S-SYS		AFT	(auto)			C-SYS									
17F				TUNING FREQUANCY (HIGHER PART)													POS 89
MODEL									MODEL								
LETTER NO.									LETTER NO.								

ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
180	TUNING FREQUANCY (LOWER PART)																POS 89
181	S-SYS			AFT	(auto)			C-SYS									
182	TUNING FREQUANCY (HIGHER PART)																POS 90
183	TUNING FREQUANCY (LOWER PART)																
184	S-SYS			AFT	(auto)			C-SYS									
185	TUNING FREQUANCY (HIGHER PART)																POS 91
186	TUNING FREQUANCY (LOWER PART)																
187	S-SYS			AFT	(auto)			C-SYS									
188	TUNING FREQUANCY (HIGHER PART)																POS 92
189	TUNING FREQUANCY (LOWER PART)																
18A	S-SYS			AFT	(auto)			C-SYS									
18B	TUNING FREQUANCY (HIGHER PART)																POS 93
18C	TUNING FREQUANCY (LOWER PART)																
18D	S-SYS			AFT	(auto)			C-SYS									
18E	TUNING FREQUANCY (HIGHER PART)																POS 94
18F	TUNING FREQUANCY (LOWER PART)																
190	S-SYS			AFT	(auto)			C-SYS									
191	TUNING FREQUANCY (HIGHER PART)																POS 95
192	TUNING FREQUANCY (LOWER PART)																
193	S-SYS			AFT	(auto)			C-SYS									
194	TUNING FREQUANCY (HIGHER PART)																POS 96
195	TUNING FREQUANCY (LOWER PART)																
196	S-SYS			AFT	(auto)			C-SYS									
197	TUNING FREQUANCY (HIGHER PART)																POS 97
198	TUNING FREQUANCY (LOWER PART)																
199	S-SYS			AFT	(auto)			C-SYS									
19A	TUNING FREQUANCY (HIGHER PART)																POS 98
19B	TUNING FREQUANCY (LOWER PART)																
19C	S-SYS			AFT	(auto)			C-SYS									
19D	TUNING FREQUANCY (HIGHER PART)																POS 99
19E	TUNING FREQUANCY (LOWER PART)																
19F	S-SYS			AFT	(auto)			C-SYS									
1A0																	AV1
1A1																	
1A2					(auto)			C-SYS									
1A3																	AV2
1A4																	
1A5					(auto)			C-SYS									
1A6																	
1A7																	
1A8																	
1A9																	
1AA																	
1AB																	
1AC																	
1AD																	
1AE																	
1AF																	
1B0																	
1B1																	
1B2																	
1B3																	
1B4																	
1B5																	
1B6																	
1B7																	
1B8																	
1B9																	
1BA																	
1BB																	
1BC																	
1BD																	
1BE																	
1BF																	
MODEL									MODEL								
LETTER NO.									LETTER NO.								

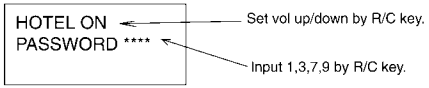
ADDRESS	DATA								MICON	EEPROM	EEPROM	CHASSIS		CTV FINAL		LAST INITIAL SETTING DATA	REMARK
(HEX)	D7	D6	D5	D4	D3	D2	D1	D0	DEFAULT	RANGE	WRITE(CPU)	CHECK DATA	CHECK TYPE	CHECK DATA	CHECK TYPE		
1C0																	
1C1																	
1C2																	
1C3																	
1C4																	
1C5																	
1C6																	
1C7																	
1C8																	
1C9																	
1CA																	
1CB																	
1CC																	
1CD																	
1CE																	
1CF																	
1D0																	
1D1																	
1D2																	
1D3																	
1D4																	
1D5																	
1D6																	
1D7																	
1D8																	
1D9																	
1DA																	
1DB																	
1DC																	
1DD																	
1DE																	
1DF																	
1E0																	
1E1																	
1E2																	
1E3																	
1E4																	
1E5																	
1E6																	
1E7																	
1E8																	
1E9																	
1EA																	
1EB																	
1EC																	
1ED																	
1EE																	
1EF																	
1F0																	
1F1																	
1F2																	
1F3																	
1F4																	
1F5																	
1F6																	
1F7																	
1F8																	
1F9																	
1FA																	
1FB																	
1FC																	
1FD																	
1FE																	
1FF																	
MODEL									MODEL								
LETTER NO.									LETTER NO.								

GA1 HOTEL MODE APPLICATION

How to enable/disable the "Hotel Mode" ?

Ans: a) Press the R/C (FUNCTION) {1} key until language selection appear, within five second press the (one/two digit) {2} key and keep pressing it for five second, then you can see the hotel mode with four digits password.

b) Key in the four digits password starting with number "1", "3", "7", "9", then the hotel mode will be enable, you can switch on/off the hotel mode by using R/C (volume up/down) {3} key.



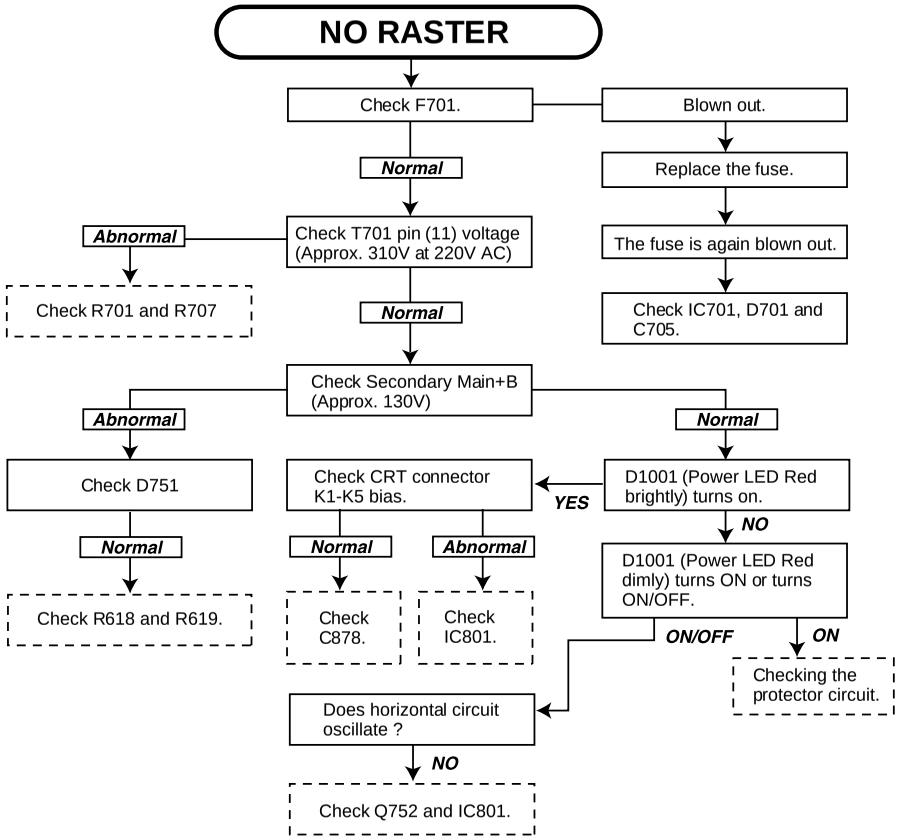
#1 Ch 1 is your selected channel for hotel mode.

* We recommend
  Before set the hotel mode, it is better to choose ch 1 & set s-vol level Up to 75% full scale.
  After set hotel mode, starting channel will be always ch 1 & maximum sound level out will be set the half of full scale.
* If you set hotel mode in AV, starting channel will be the last ch which you received before power off (same as normal operation)

CONDITION:

When using hotel mode, user can control "contrast", "brightness", "sharpness" and "tint" function.
But after power off, it will return to the initial setting.
You can't use:--
Preset mode
Fine tuning
Skip mode
System selection
The others function is allowed to be used.

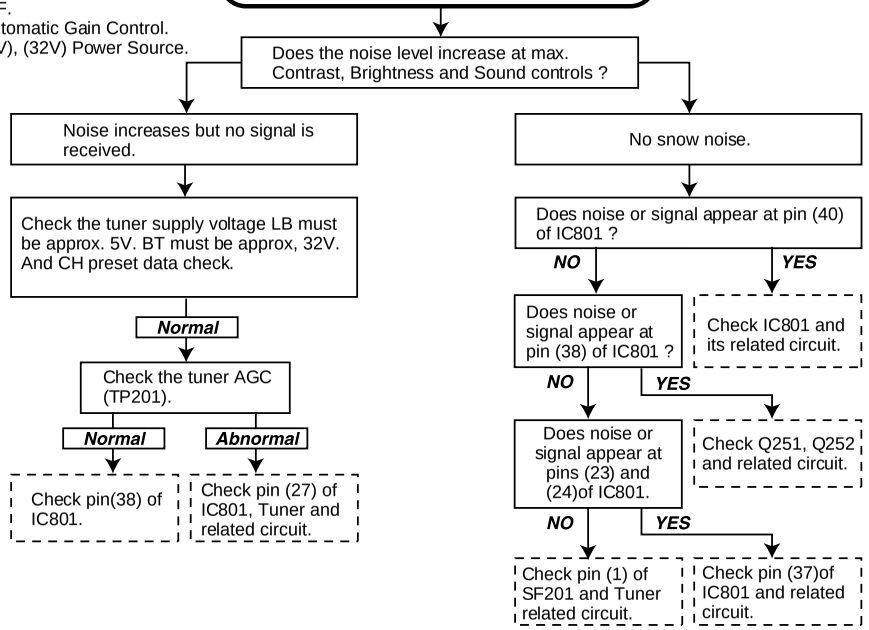
TROUBLE SHOOTING TABLE



TROUBLE SHOOTING TABLE (Continued)

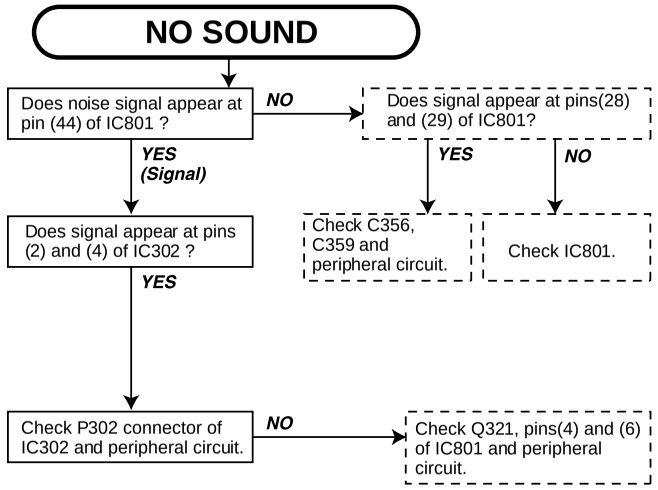
CIRCUITS TO BE CHECKED:
- Tuner.
- PIF.
- Automatic Gain Control.
- (5V), (32V) Power Source.

NO PICTURE, NO SOUND


Does the noise level increase at max. Contrast, Brightness and Sound controls ?
Noise increases but no signal is received.
No snow noise.
Check the tuner supply voltage LB must be approx. 5V. BT must be approx, 32V. And CH preset data check.
Does noise or signal appear at pin (40) of IC801 ?
NO
YES
Normal
Does noise or signal appear at pin (38) of IC801 ?
Check IC801 and its related circuit.
Check the tuner AGC (TP201).
NO
YES
Normal
Abnormal
Does noise or signal appear at pins (23) and (24)of IC801.
Check Q251, Q252 and related circuit.
Check pin(38) of IC801.
Check pin (27) of IC801, Tuner and related circuit.
NO
YES
Check pin (1) of SF201 and Tuner related circuit.
Check pin (37)of IC801 and related circuit.

CIRCUITS TO BE CHECKED:
- Sound system pins (28), (29) and (44) of IC801.
- Sound Detector Circuit.
- Sound Switch and Att. Control.
- Audio Output Circuit.

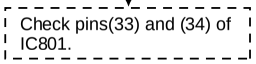
NO SOUND


Does noise signal appear at pin (44) of IC801 ?
NO
Does signal appear at pins(28) and (29) of IC801?
YES (Signal)
YES
NO
Does signal appear at pins (2) and (4) of IC302 ?
Check C356, C359 and peripheral circuit.
Check IC801.
YES
Check P302 connector of IC302 and peripheral circuit.
NO
Check Q321, pins(4) and (6) of IC801 and peripheral circuit.

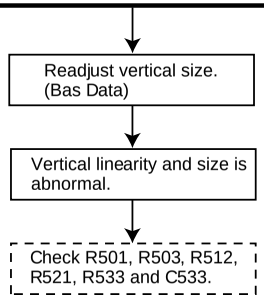
TROUBLE SHOOTING TABLE (Continued)

NEITHER VERTICAL NOR HORIZONTAL SYNCHRONIZATION

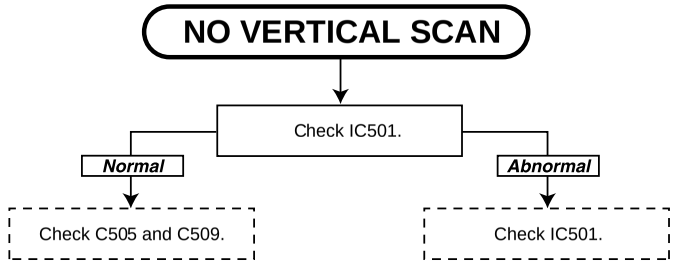
CIRCUIT TO BE CHECKED:
- Sync. Separator Circuit.



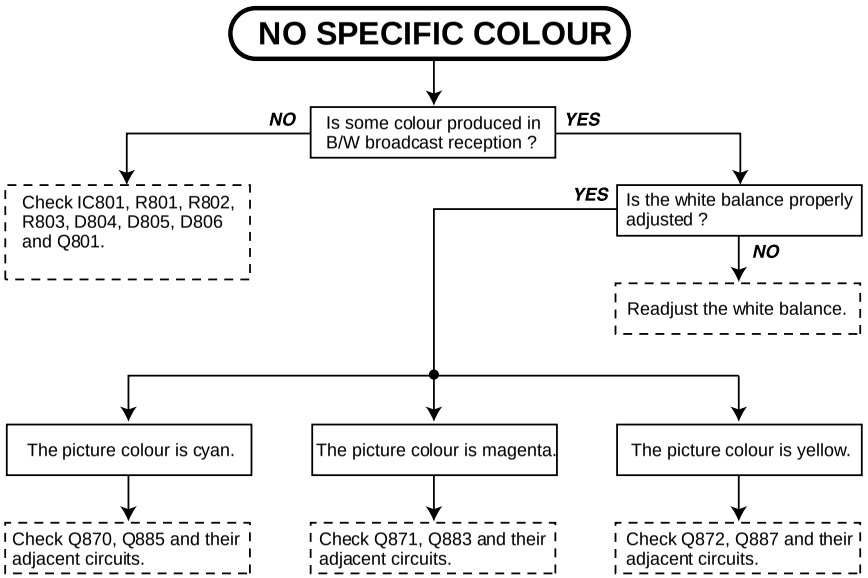
DEFECTIVE VERTICAL AMP. AND VERTICAL LINEARITY

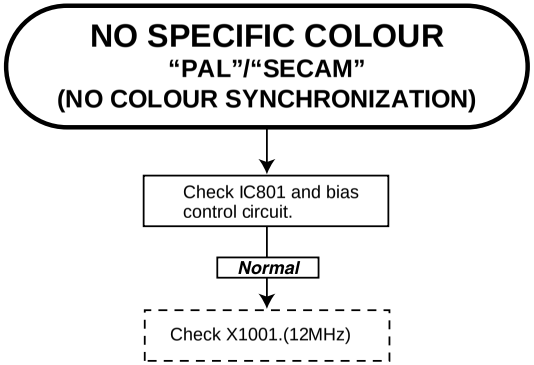


NO VERTICAL SCAN

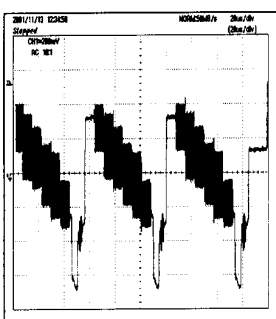
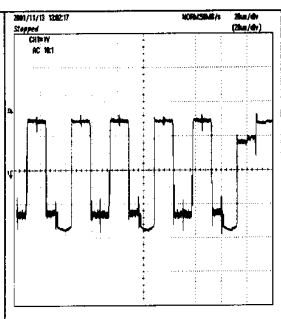
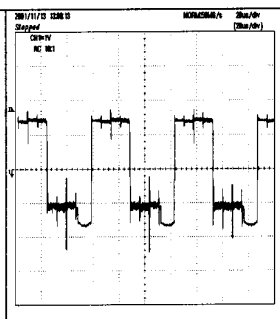
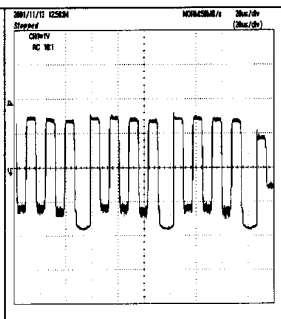
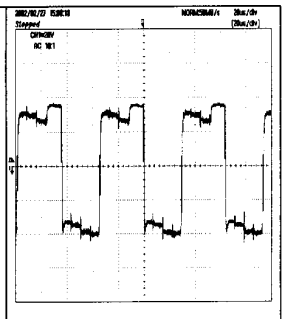
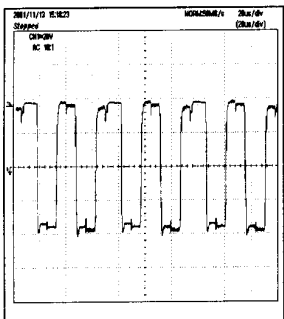
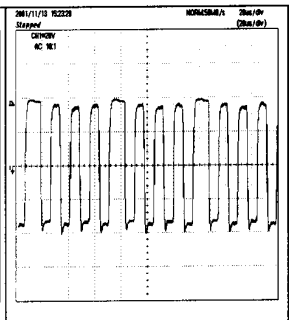
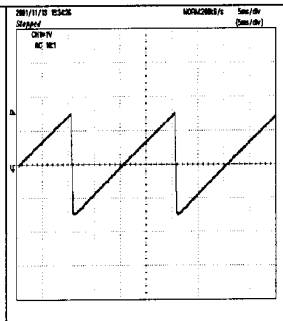
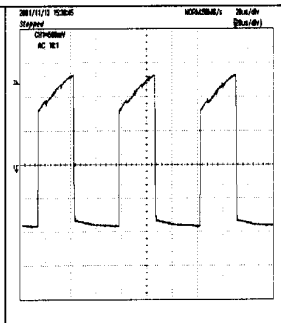
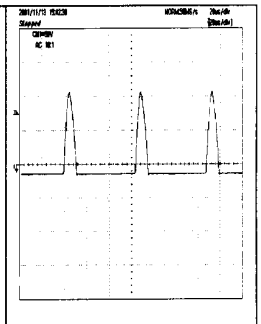
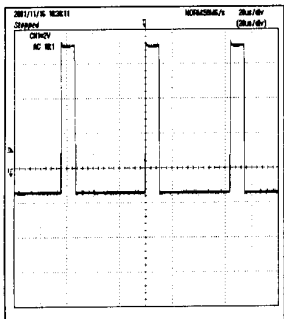
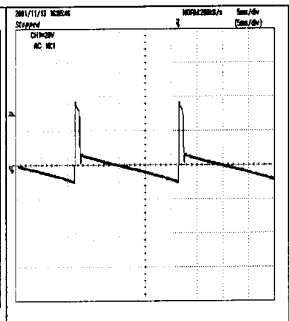
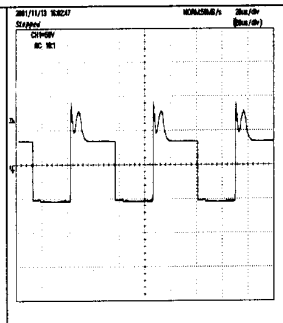
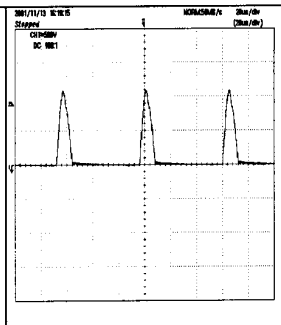
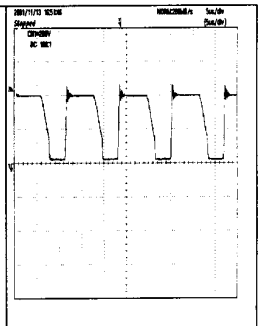
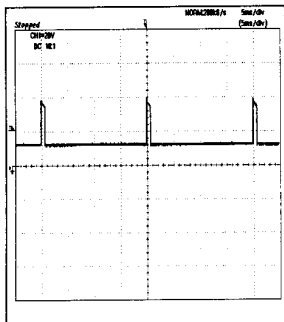
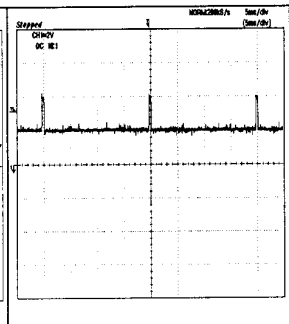


TROUBLE SHOOTING TABLE (Continued)


NO SPECIFIC COLOUR
NO
Is some colour produced in B/W broadcast reception ?
YES
Check IC801, R801, R802, R803, D804, D805, D806 and Q801.
YES
Is the white balance properly adjusted ?
NO
Readjust the white balance.
The picture colour is cyan.
The picture colour is magenta.
The picture colour is yellow.
Check Q870, Q885 and their adjacent circuits.
Check Q871, Q883 and their adjacent circuits.
Check Q872, Q887 and their adjacent circuits.

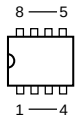


WAVEFORMS

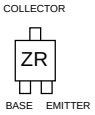
				
1) 1.0 Vp-p (H)	2) 3.17 Vp-p (H)	3) 3.11 Vp-p (H)	4) 3.11 Vp-p (H)	5) 84.8 Vp-p (H)
				
6) 80.0 Vp-p (H)	7) 80 Vp-p (H)	8) 3.04 Vp-p (V)	9) 2.28 Vp-p (H)	10) 126 Vp-p (H)
				
11) 8.8 Vp-p (H)	12) 47.2 Vp-p (V)	13) 146 Vp-p (H)	14) 1.1 kVp-p (H)	15) 440 Vp-p
				
16) 28 Vp-p (V)	17) 2.64 Vp-p (V)			

SOLID STATE DEVICE BASE DIAGRAM

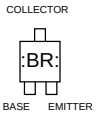
TOP VIEW



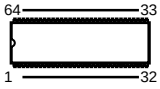
CAT24W04
(M24C04)
(BR24C04)



D601A

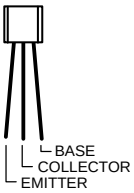


B709A

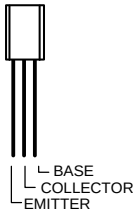


IX3368CE

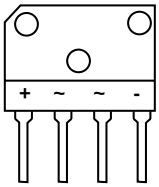
SIDE VIEW



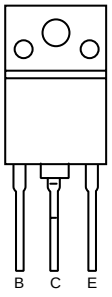
TX0110BM
TX0124BM
2SC3198



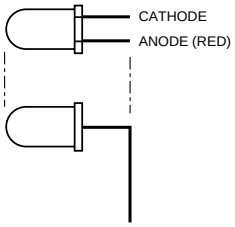
2SC3207
2PC1815



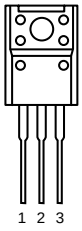
DX0111PE



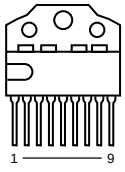
2SD2586



PX0013PE



KA7808A



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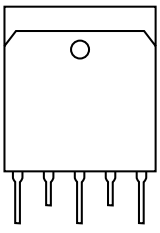

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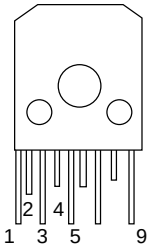
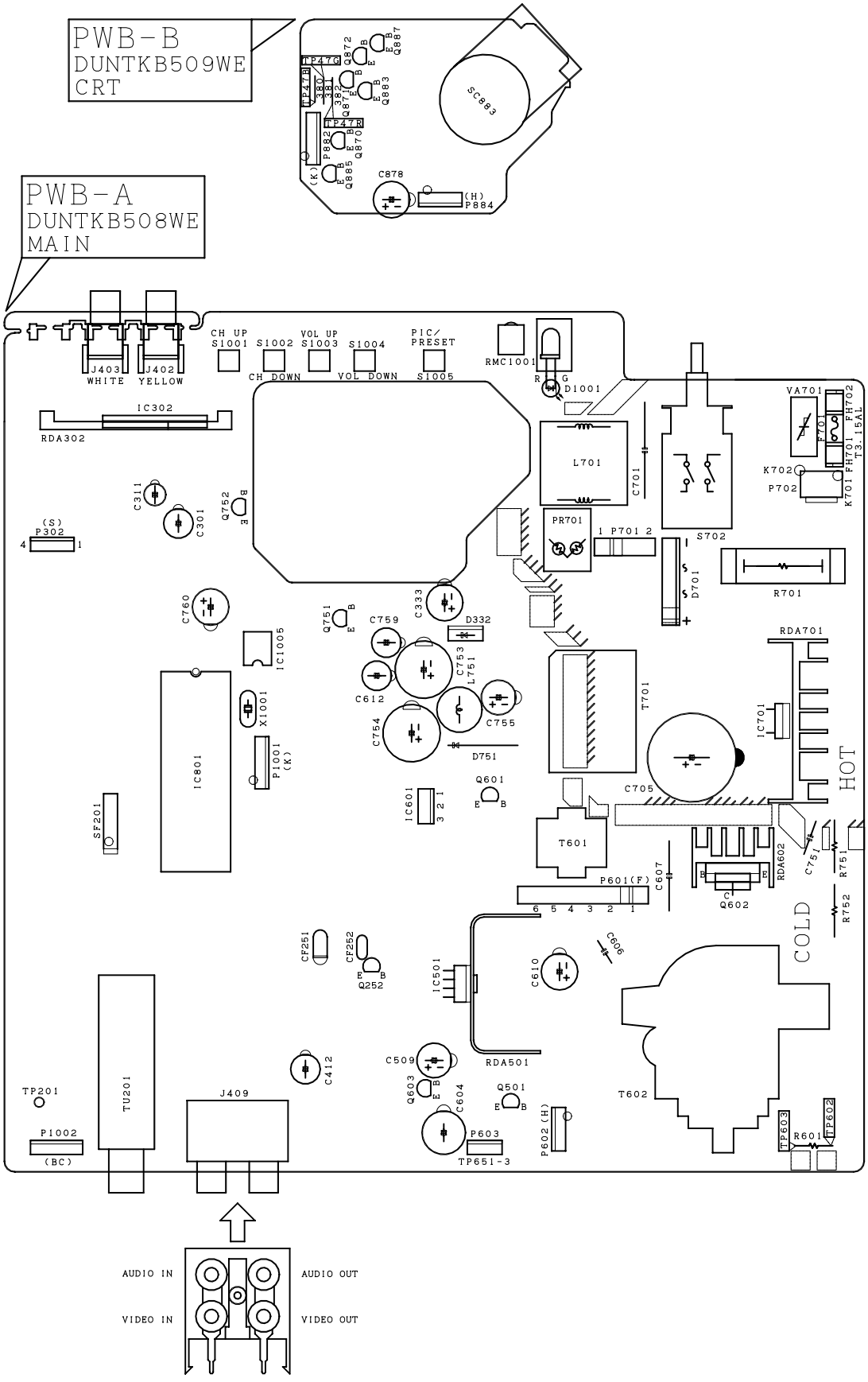


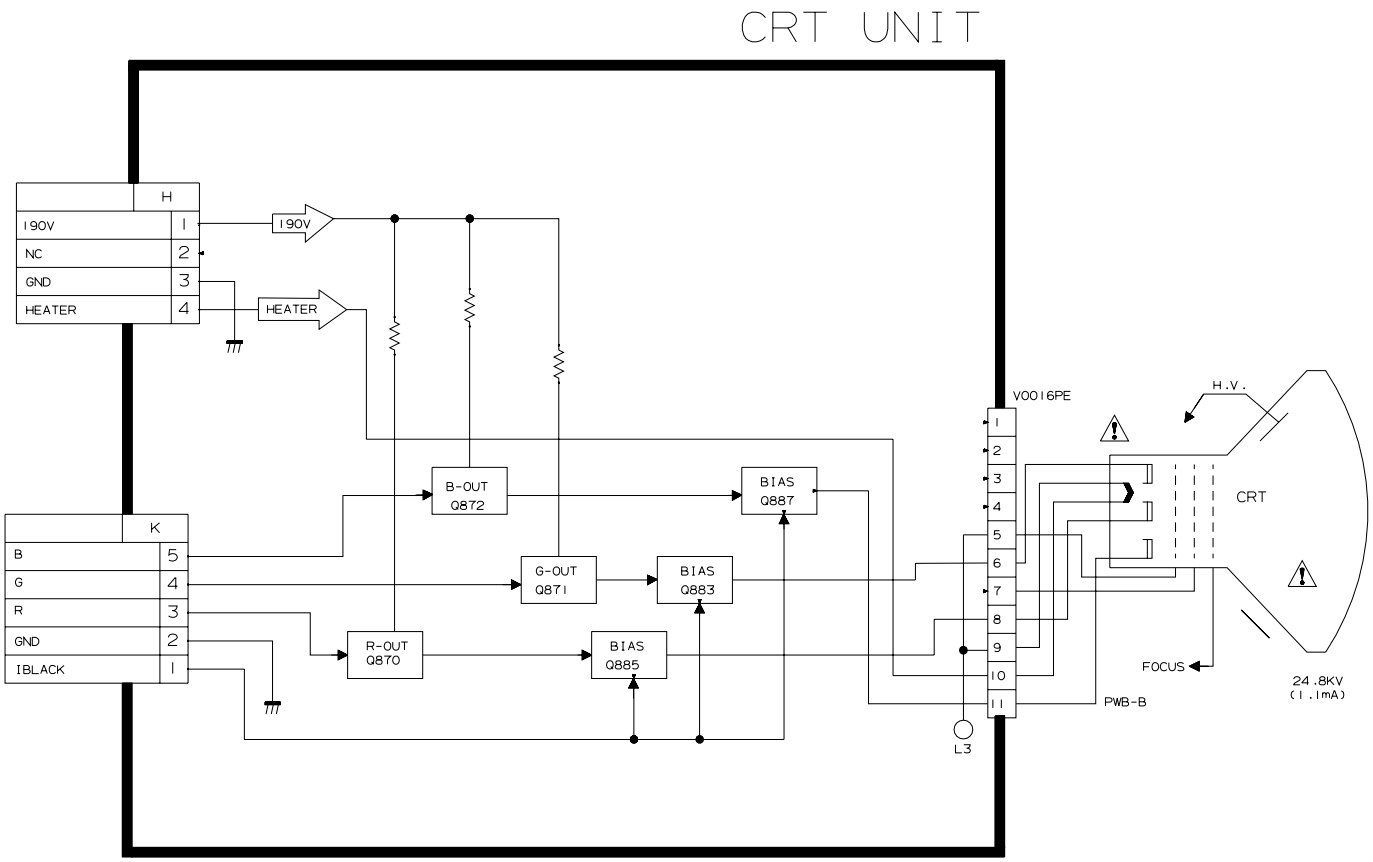
TDA9302

CHASSIS LAYOUT

21BM2GMK2 MODEL

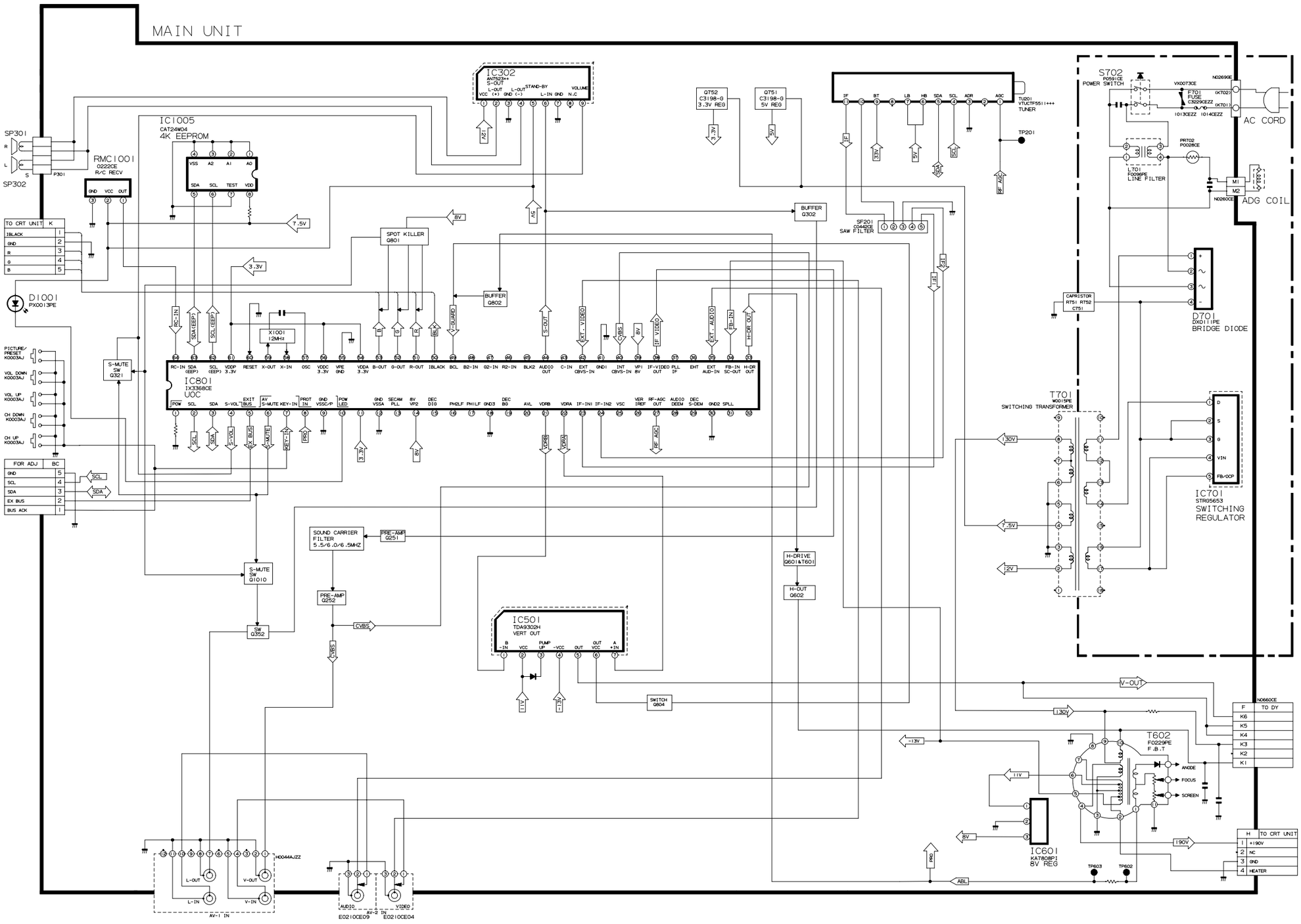


BLOCK DIAGRAM:CRT UNIT



21BM2GMK2

BLOCK DIAGRAM:MAIN UNIT



DESCRIPTION OF SCHEMATIC DIAGRAM

SAFETY NOTES:

1. *DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS.*
2. *SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.*

IMPORTANT SAFETY NOTICE:

PARTS MARKED WITH " ⚠ " ( ) ARE IMPOTANT FOR MAINTAINING THE SAFETY OF THE SET. BE SURE TO REPLACE THESE PARTS WITH SPECIFIED ONES FOR MAINTAINING THE SAFETY AND PERFORMANCE OF THE SET.

SERVICE PRECAUTION:

THE AREA ENCLOSED BY THIS LINE (── - ──) IS DIRECTLY CONNECTED WITH AC MAINS VOLTAGE.
WHEN SERVICING THE AREA, CONNECT AN ISOLATING TRANSFORMER BETWEEN TV RECEIVER AND AC LINE TO ELIMINATE HAZARD OF ELECTRIC SHOCK.

NOTES:

1. *The unit of resistance "ohm" is omitted. (K = 1000 ohms, M = Mega ohm).*
2. *All resistors are 1/10 watt, unless otherwise noted.*
3. *All capacitors are μF, unless otherwise noted. (P = μμF).*

VOLTAGE MEASUREMENT CONDITIONS:

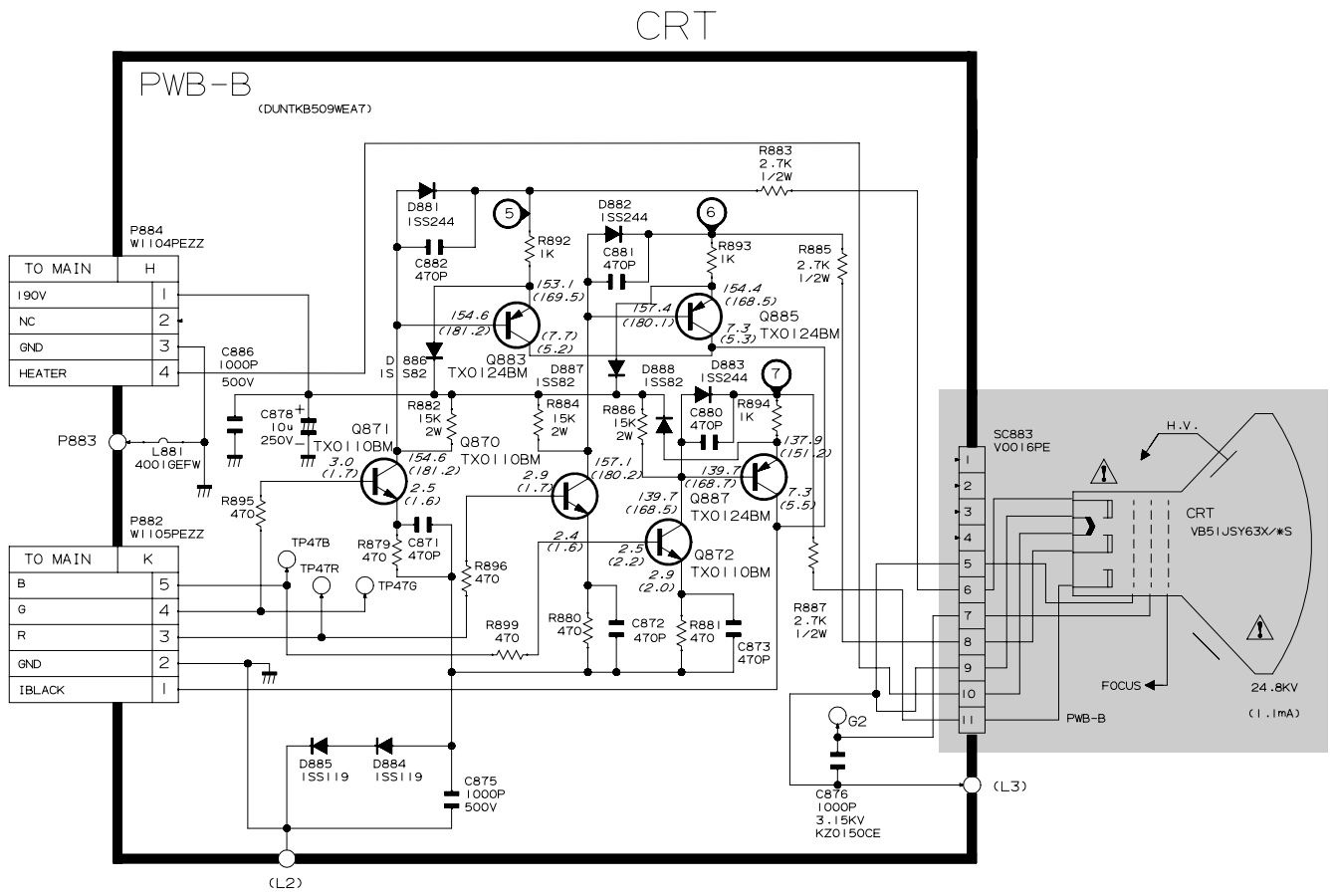
1. *Voltages in parenthesis measured with no signal.*
2. *Voltages without parenthesis measured with 3mV B & W or Colour signal.*
3. *All the voltages in each point are measured with VTVM.*

WAVEFORM MEASUREMENT CONDITIONS:

1. *The colour bar generator signal of 2.0V peak applied at of Base Video Buffer Amp. Q252.*
2. *Approximately 4V AGC bias .*

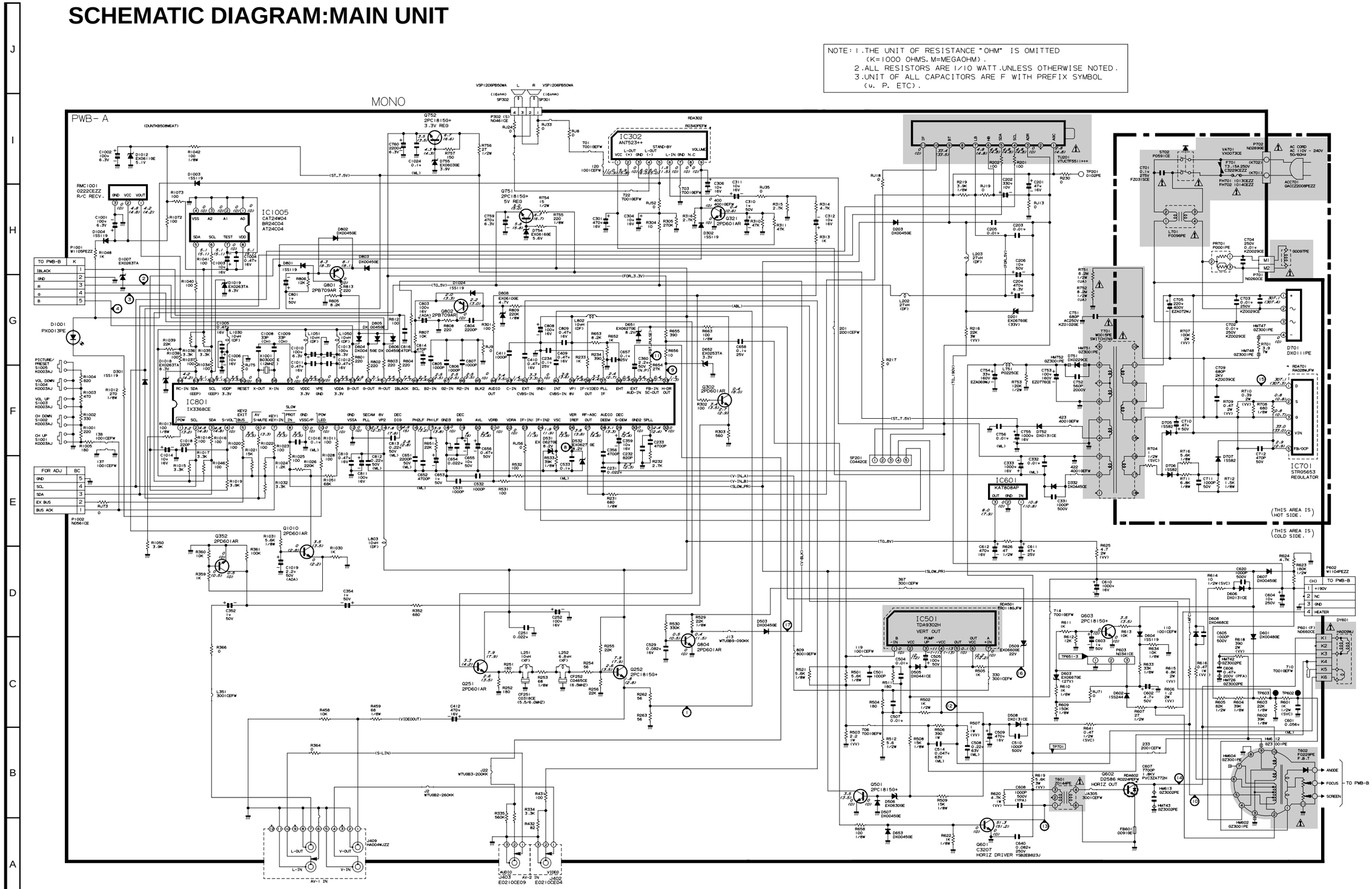
SCHEMATIC DIAGRAM:CRT UNIT

NOTE: 1.THE UNIT OF RESISTANCE "OHM" IS OMITTED
(K=1000 OHMS. M=MEGAOHM).
2.ALL RESISTORS ARE 1/10 WATT.UNLESS OTHERWISE NOTED.
3.UNIT OF ALL CAPACITORS ARE F WITH PREFIX SYMBOL
(u. P. ETC).



21R2MK2S

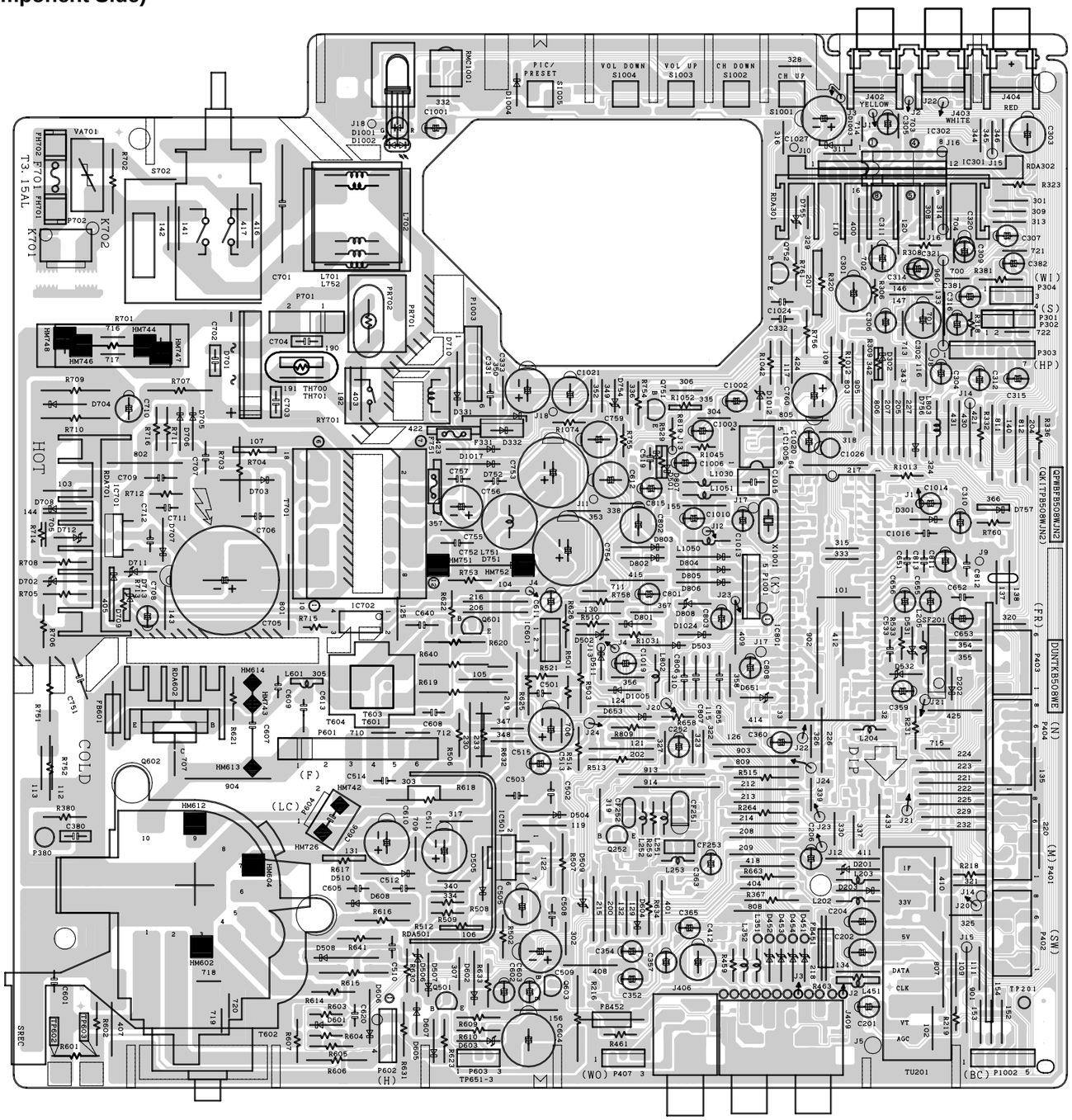
SCHEMATIC DIAGRAM:MAIN UNIT



21BM2GMK2

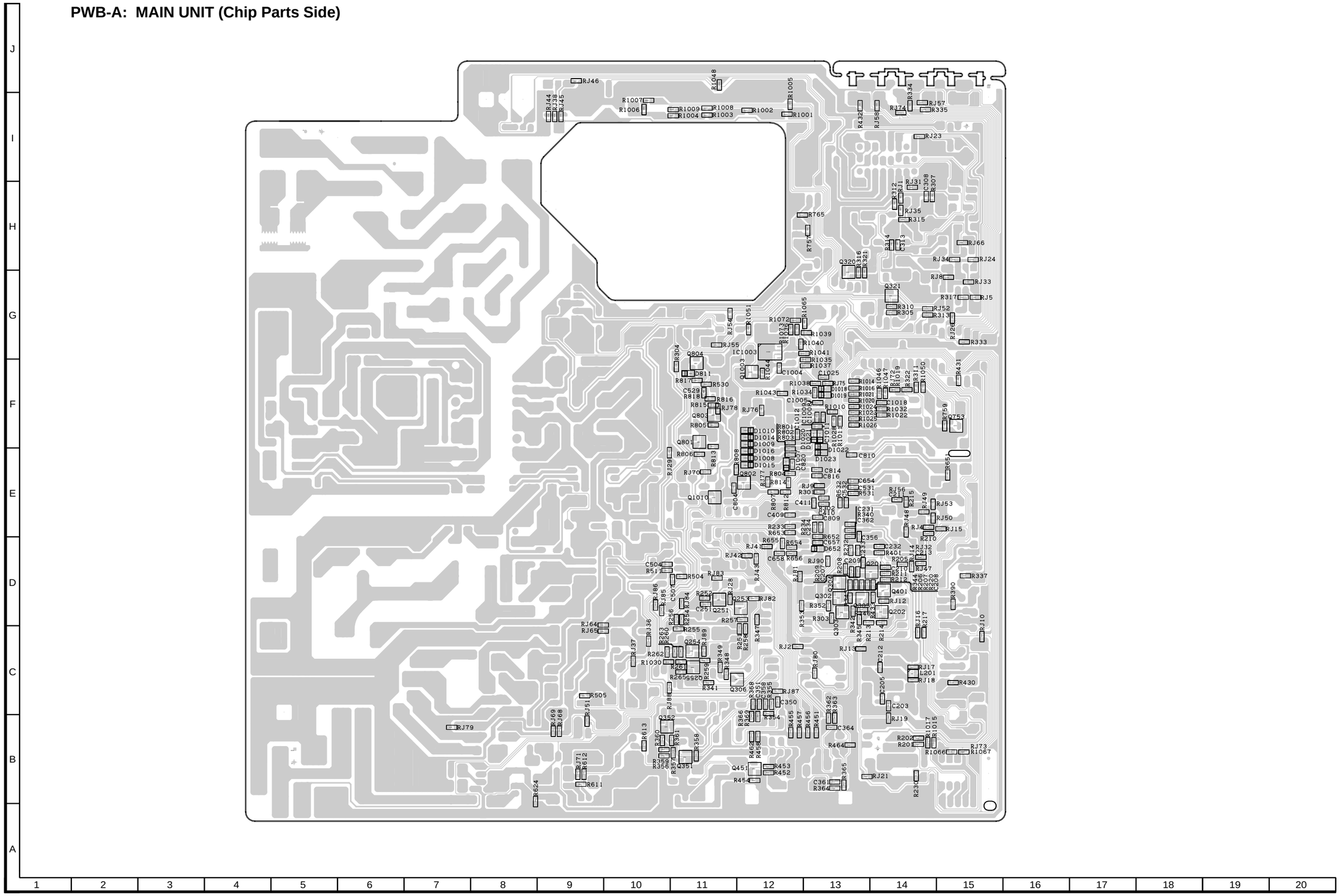
PRINTED WIRING BOARD ASSEMBLIES

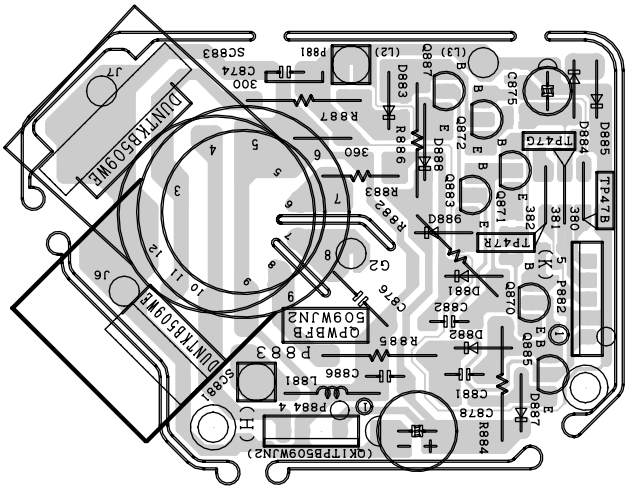
PWB-A: MAIN UNIT (Component Side)



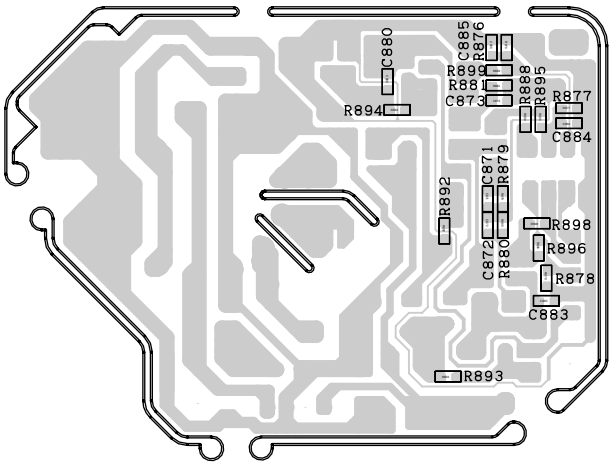
21R2MK2S

PWB-A: MAIN UNIT (Chip Parts Side)





PWB-B: CRT UNIT (Copper Side)



PWB-B: CRT UNIT (Chip Parts Side)

REPLACEMENT PARTS LIST

PARTS REPLACEMENT

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠" in the Replacement Parts Lists.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommended replacement parts shown in this service manual may create shock, fire or other hazards.

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER **2. REF. NO.**
3. PART NO. **4. DESCRIPTION**

MARK ★ SPARE PARTS-DELIVERY SECTION.

Ref. No.	Part No.	★	Description	Code
PICTURE TUBE				
⚠	VB51JSY63X/*S	R	Picture Tube	CE
⚠	RCiLG0097PEZZ	R	Degaussing Coil	AP
⚠ DY601	RCiLHA009WJZZ	R	Deflection Yoke	BB
	QEARC2107PEZZ	R	Grounding Strap	AE
	PMAGF3046CEZZ	R	Magnet	AF
PRINTED WIRING BOARD ASSEMBLIES *(NOT REPLACEMENT ITEM)*				
PWB-A	DUNTKB508WEA7	-	Main. Unit	—
PWB-B	DUNTKB509WEA7	-	CRT Unit	—
DUNTKB508WEA7 PWB-A Main Unit				
TUNER				
NOTE:	***THE PARTS HERES SHOWN ARE SUPPLIED AS AN ASSEMBLY NOT INDEPENDENTLY.***			
⚠ TU201	VTUCTF5511+++	R	Tuner	AZ
INTEGRATED CIRCUITS				
IC302	VHiAN7523++-1	R	AN7523	AH
⚠ IC501	VHiTDA9302H-1	R	TDA9302H	AH
IC601	VHiKA7808AP-1	R	KIA7808API	AE
IC701	VHiSTRG5653-1	R	STR-G5653	AQ
IC801	RH-iX3368CEN6	R	I.C.	BE
IC1005	VHiCAT24W04-1	R	I.C.	AE
TRANSISTORS				
Q251	VS2PD601AR/-1Y	R	2PD601AR	AB
Q252	VS2PC1815G+-1+	R	2PC1815G+	AC
Q302	VS2PD601AR/-1Y	R	2PD601AR	AB
Q321	VS2PD601AR/-1Y	R	2PD601AR	AB
Q352	VS2PD601AR/-1Y	R	2PD601AR	AB
Q501	VS2PC1815G+-1+	R	2PC1815G+	AC
Q601	VS2SC3207//-1+	R	2SC3207	AC
Q602	VS2SD2586//1E	R	2SD2586	AM
Q603	VS2PC1815G+-1+	R	2PC1815G+	AC
Q751	VS2PC1815G+-1+	R	2PC1815G+	AC
Q752	VS2PC1815G+-1+	R	2PC1815G+	AC
Q801	VS2PB709AR/-1Y	R	2PB709AR	AB
Q802	VS2PB709AR/-1Y	R	2PB709AR	AB
Q804	VS2PD601AR/-1Y	R	2PD601AR	AB
Q1010	VS2PD601AR/-1Y	R	2PD601AR	AB
DIODES AND LED'S				
D201	RH-EX0676GEZZY	R	Zener Diode 33V	AA
D203	RH-DX0045GEZZY	R	Diode	AA
D301	VHD1SS119//-1Y	R	1SS119	AA
D302	VHD1SS119//-1Y	R	1SS119	AA
D332	RH-DX0445CEZZ	R	Diode	AL
D503	RH-DX0045GEZZY	R	Diode	AA
D505	RH-DX0441CEZZY	R	Diode	AC
D506	RH-EX0630GEZZY	R	Zener Diode	AA
D507	RH-DX0045GEZZY	R	Diode	AA
D508	RH-DX0131CEZZY	R	Diode	AC
D509	RH-EX0660GEZZY	R	Zener Diode 22V	AB
D531	RH-EX0627GEZZY	R	Zener Diode 8.2V	AA
D532	RH-EX0627GEZZY	R	Zener Diode 8.2V	AA
D601	RH-DX0048GEZZY	R	Diode	AA
D602	VHD1SS244//-1Y	R	1SS244	AB
D603	RH-EX0667GEZZY	R	Zener Diode 27V	AA
D604	VHD1SS119//-1Y	R	1SS119	AA
D606	RH-DX0131CEZZY	R	Diode	AC
D607	RH-DX0045GEZZY	R	Diode	AA
D608	RH-DX0468CEZZ	R	Diode	AE
D651	RH-EX0627GEZZY	R	Zener Diode 8.2V	AA
D652	RH-EX0253TAZZY	R	Zener Diode 3.3V	AC
D653	RH-DX0045GEZZY	R	Diode	AA
D701	RH-DX0111PEZZ	R	Diode	AG
D705	VHD1SS82///1AY	R	1SS82	AC
D706	VHD1SS82///1AY	R	1SS82	AC
D707	VHD1SS82///1AY	R	1SS82	AC
D751	RH-DX0229CEZZ	R	Diode	AF
D752	RH-DX0131CEZZY	R	Diode	AC
D754	RH-EX0616GEZZY	R	Zener Diode 5.6V	AA
D755	RH-EX0603GEZZY	R	Zener Diode 3.9V	AA
D801	VHD1SS119//-1Y	R	1SS119	AA
D802	RH-DX0045GEZZY	R	Diode	AA
D803	RH-DX0045GEZZY	R	Diode	AA
D804	RH-DX0045GEZZY	R	Diode	AA
D805	RH-DX0045GEZZY	R	Diode	AA
D806	RH-DX0045GEZZY	R	Diode	AA
D808	RH-EX0610GEZZY	R	Zener Diode 4.7V	AA
D1001	RH-PX0013PEZZ	R	PhotoDiode	AC
D1003	VHD1SS119//-1Y	R	1SS119	AA
D1004	VHD1SS119//-1Y	R	1SS119	AA
D1007	RH-EX0263TAZZY	R	Zener Diode 8.3V	AC
D1012	RH-EX0611GEZZY	R	Zener Diode 5.1V	AA
D1018	RH-EX0263TAZZY	R	Zener Diode 8.3V	AC
D1019	RH-EX0263TAZZY	R	Zener Diode 8.3V	AC
D1024	VHD1SS119//-1Y	R	1SS119	AA
PACKAGED CIRCUITS				
⚠ VA701	RH-VX0073CEZZ	R	Varistor	AD
PR701	RMPTP0001PEZZ	R	Packaged Circuit	AN
X1001	RCRSB0300CEZZ	R	"Crystal, 12MHz"	AF
COILS AND TRANSFORMERS				
CF251	RFiLC0318CEZZ	R	Filter	AG
CF252	RFiLC0465CEZZ	R	Filter	AD
L202	VP-DF270K0000Y	R	Peaking 27µH	AB
L203	VP-DF270K0000Y	R	Peaking 27µH	AB
L251	VP-XF100K0000Y	R	Peaking 10µH	AB
L252	VP-XF6R8K0000Y	R	Peaking 6.8µH	AB
⚠ L701	RCiLF0096PEZZ	R	Coil	AF
L751	RCiLP0225CEZZ	R	Coil	AF
L802	VP-DF100K0000Y	R	Peaking 10µH	AB
L803	VP-DF100K0000Y	R	Peaking 10µH	AB
L1030	VP-DF100K0000Y	R	Peaking 10µH	AB
L1050	VP-DF100K0000Y	R	Peaking 10µH	AB
L1051	VP-DF100K0000Y	R	Peaking 10µH	AB
SF201	RFiLC0442CEZZ	R	Filter	AL
⚠ T601	RTRNZ0144PEZZ	R	Transformer	AE
⚠ T602	RTRNF0229PEZZ	R	H-Volt Transformer	AY

Ref. No.	Part No.	★	Description			Code
⚠ T701	RTRNW0015PEZZ	R	Transformer			AL

CAPACITORS

C201	VCEA0A1CW476M+	R	47	16V	Electrolytic	AB
C202	VCEA0A1AW337M+	R	330	10V	Electrolytic	AC
C203	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C204	VCEA0A0JW477M+	R	470	6.3V	Electrolytic	AC
C205	VCKYCY1HF103Z	R	0.01	50V	Ceramic	AA
C206	VCEA0A1HW106M+	R	10	50V	Electrolytic	AB
C231	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C232	VCKYCY1HB821K	R	820p	50V	Ceramic	AA
C233	VCKYCY1HB472K	R	4700p	50V	Ceramic	AA
C234	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C251	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C252	VCEA0A1CW107M+	R	100	16V	Electrolytic	AC
C301	VCEA0A1CW477M+	R	470	16V	Electrolytic	AC
C304	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C306	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C310	VCEA0A1HW105M+	R	1	50V	Electrolytic	AB
C311	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C312	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C331	VCKYPA2HB102K+	R	1000p	500V	Ceramic	AA
C332	RC-QZA103TAYJ+	R	0.01	50V	Mylar	AB
C333	VCEA0A1CW108M	R	1000	16V	Electrolytic	AD
C352	VCEA0A1HW105M+	R	1	50V	Electrolytic	AB
C354	VCEA0A1HW105M+	R	1	50V	Electrolytic	AB
C356	VCKYCY1HB472K	R	4700p	50V	Ceramic	AA
C359	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C360	VCE9GA1HW225M+	R	2.2	50V	Elect.(N,P)	AB
C409	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C410	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C411	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C412	VCEA0A1CW477M+	R	470	16V	Electrolytic	AC
C501	VCKYPA1HB102K+	R	1000p	50V	Ceramic	AA
C504	VCKYCY1HB103K	R	0.01	50V	Ceramic	AA
C505	VCEA0A1HW107M+	R	100	50V	Electrolytic	AB
C507	VCKYCY1HB103K	R	0.01	50V	Ceramic	AA
C508	VCFYSA1JB224J+	R	0.22	63V	Mylar	AD
C509	VCEA0A1CW477M+	R	470	16V	Electrolytic	AC
C510	VCKYPA2HB102K+	R	1000p	500V	Ceramic	AA
C514	VCFYSA1JB473J+	R	0.047	63V	Mylar	AC
C529	VCKYCY1CB823KY	R	0.082	16V	Ceramic	AH
C531	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C532	VCKYCY1HB102K	R	1000p	50V	Ceramic	AA
C533	RC-QZA104TAYJ+	R	0.1	50V	Mylar	AB
C601	RC-QZA563TAYJ+	R	0.056	50V	Mylar	AB
C602	VCEA0A1HW475M+	R	4.7	50V	Electrolytic	AB
C603	VCEA0A1HW105M+	R	1	50V	Electrolytic	AB
C604	VCEA0A2EW106M	R	10	250V	Electrolytic	AD
C605	VCKYPA2HB102K+	R	1000p	500V	Ceramic	AA
C606	VCFPVC2DB474J	R	0.47	200V	M.Polypro	AE
C607	VCFPVC3ZA772H	R	7700p	1.8kV	M.Polypro	AD
C608	VCKYPA2HB102K+	R	1000p	500V	Ceramic	AA
C610	VCEA0A1CW108M	R	1000	16V	Electrolytic	AD
C611	VCEA0A1EW476M+	R	47	25V	Electrolytic	AB
C612	VCEA0A1CW477M+	R	470	16V	Electrolytic	AC
C620	VCKYPA2HB102K+	R	1000p	500V	Ceramic	AA
C640	VCFYSB2EB823J	R	0.082	250V	Mylar	AD
C651	VCQYTA1HM222J+	R	2200p	50V	Mylar	AA
C652	RC-QZA472TAYJ+	R	4700p	50V	Mylar	AB
C653	VCEA0A1HW105M+	R	1	50V	Electrolytic	AB
C654	VCKYCY1HF223Z	R	0.022	50V	Ceramic	AB
C655	VCEA0A1HW106M+	R	10	50V	Electrolytic	AB
C656	VCEA0A1HW474M+	R	0.47	50V	Electrolytic	AB
C657	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
C658	VCKYCY1EF104Z	R	0.1	25V	Ceramic	AA
⚠ C701	RC-FZ031SCEZZ	R	0.1	275V		AD
C702	RC-KZ0029CEZZ+	R	0.01	250V	Ceramic	AC
C703	RC-KZ0029CEZZ+	R	0.01	250V	Ceramic	AC
C704	RC-KZ0029CEZZ+	R	0.01	250V	Ceramic	AC
C705	RC-EZA072WJZZ	R	220	400V	Electrolytic	AN
C709	RC-KZ0039CEZZ	R	680p	2kV	Ceramic	AB
C710	VCEA0A1HW476M+	R	47	50V	Electrolytic	AB
C711	VCKYPA1HB102K+	R	1000p	50V	Ceramic	AA
C712	VCKYPA1HB471K+	R	470p	50V	Ceramic	AA
⚠ C751	RC-KZ0102GEZZ	R	680p	AC250V	Ceramic	AE

Ref. No.	Part No.	★	Description			Code
C752	VCKYPH3DB561K	R	560p	2kV	Ceramic	AC
C753	RC-EZ0776CEZZ	R	100	160V	Electrolytic	AF
C754	RC-EZA069WJZZ	R	33	160V	Electrolytic	AE
C755	VCEA0A1CW108M	R	1000	16V	Electrolytic	AD
C756	RC-QZA103TAYJ+	R	0.01	50V	Mylar	AB
C759	VCEA0A0JW477M+	R	470	6.3V	Electrolytic	AC
C760	VCEA0A0JW228M	R	2200	6.3V	Electrolytic	AD
C801	VCEA0A1HW105M+	R	1	50V	Electrolytic	AB
C803	VCEA0A1CW107M+	R	100	16V	Electrolytic	AC
C804	VCKYCY1HB222K	R	2200p	50V	Ceramic	AA
C805	VCKYD41HB102KY	R	1000p	50V	Ceramic	AA
C806	VCKYD41HB102KY	R	1000p	50V	Ceramic	AA
C807	VCKYD41HB102KY	R	1000p	50V	Ceramic	AA
C808	VCEA0A1CW107M+	R	100	16V	Electrolytic	AC
C809	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C810	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C811	VCEA0A1CW107M+	R	100	16V	Electrolytic	AC
C812	VCFYFA1HA224J+	R	0.22	50V	Mylar	AB
C813	VCFYFA1HA224J+	R	0.22	50V	Mylar	AB
C814	VCKYCY1HB471K	R	470p	50V	Ceramic	AA
C816	VCKYCY1HB471K	R	470p	50V	Ceramic	AA
C1001	VCEA0A0JW107M+	R	100	6.3V	Electrolytic	AB
C1002	VCEA0A0JW107M+	R	100	6.3V	Electrolytic	AB
C1003	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C1004	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C1005	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C1006	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C1008	VCCCCY1HH330J	R	33p	50V	Ceramic	AA
C1009	VCCCCY1HH330J	R	33p	50V	Ceramic	AA
C1010	VCEA0A0JW107M+	R	100	6.3V	Electrolytic	AB
C1011	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C1012	VCKYCY1CF474Z	R	0.47	16V	Ceramic	AB
C1013	VCEA0A0JW107M+	R	100	6.3V	Electrolytic	AB
C1014	VCEA0A1CW106M+	R	10	16V	Electrolytic	AB
C1016	RC-QZA104TAYJ+	R	0.1	50V	Mylar	AB
C1018	VCKYCY1HB221K	R	220p	50V	Ceramic	AA
C1019	VCEA0A1HW225M+	R	2.2	50V	Electrolytic	AB
C1024	RC-QZA104TAYJ+	R	0.1	50V	Mylar	AB

RESISTORS

RJ2	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ8	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ9	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ10	VRS-CY1JF000JY	R	0	1/16W	Metal Oxide	AA
RJ13	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ14	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ15	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ16	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ17	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ18	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ19	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ21	VRS-CY1JF000JY	R	0	1/16W	Metal Oxide	AA
RJ24	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ26	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ28	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ32	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ33	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ35	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ37	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ38	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ41	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ42	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ43	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ46	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ47	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ49	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ50	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ51	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ52	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ53	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ56	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ71	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ73	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ75	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ76	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ77	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ78	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA

Ref. No.	Part No.	★	Description			Code
RJ83	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
RJ88	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
R201	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R202	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R216	VRS-VV3LB223J	R	22k	3.0W	Metal Oxide	AB
R217	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
R219	VRD-RA2BE392JY	R	3.9k	1/8W	Carbon	AA
R230	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
R231	VRD-RA2BE681JY	R	680	1/8W	Carbon	AA
R232	VRN-MD2AL272J	R	2.7k	1/10W	Metal Film	AA
R233	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R234	VRN-MD2AL391J	R	390	1/10W	Metal Film	AA
R251	VRN-MD2AL181J	R	180	1/10W	Metal Film	AA
R252	VRN-MD2AL181J	R	180	1/10W	Metal Film	AA
R253	VRD-RA2BE680JY	R	68	1/8W	Carbon	AA
R254	VRN-MD2AL560J	R	56	1/10W	Metal Film	AB
R255	VRN-MD2AL223J	R	22k	1/10W	Metal Film	AA
R256	VRN-MD2AL223J	R	22k	1/10W	Metal Film	AA
R262	VRN-MD2AL560J	R	56	1/10W	Metal Film	AB
R263	VRN-MD2AL560J	R	56	1/10W	Metal Film	AB
R301	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R302	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R303	VRN-MD2AL561J	R	560	1/10W	Metal Film	AA
R304	VRN-MD2AL100J	R	10	1/10W	Metal Film	AA
R305	VRN-MD2AL274J	R	270k	1/10W	Metal Film	AA
R310	VRN-MD2AL473J	R	47k	1/10W	Metal Film	AA
R311	VRN-MD2AL473J	R	47k	1/10W	Metal Film	AA
R313	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R314	VRN-MD2AL472J	R	4.7k	1/10W	Metal Film	AA
R315	VRN-MD2AL272J	R	2.7k	1/10W	Metal Film	AA
R316	VRN-MD2AL272J	R	2.7k	1/10W	Metal Film	AA
R334	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R335	VRS-CY1JF564JY	R	560k	1/16W	Metal Oxide	AA
R352	VRN-MD2AL681J	R	680	1/10W	Metal Film	AA
R359	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R360	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R361	VRN-MD2AL104J	R	100k	1/10W	Metal Film	AA
R364	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
R366	VRN-MD2AL000J	R	0	1/10W	Metal Film	AA
R431	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R432	VRN-MD2AL820J	R	82	1/10W	Metal Film	AA
R458	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R459	VRD-RA2BE680JY	R	68	1/8W	Carbon	AA
R501	VRD-RA2BE562JY	R	5.6k	1/8W	Carbon	AA
R502	VRD-RM2HD102JY	R	1k	1/2W	Carbon	AA
R503	VRN-VV3AB2R2J	R	2.2	1W	Metal Film	AA
R504	VRN-MD2AL181J	R	180	1/10W	Metal Film	AA
R505	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R506	VRS-VV3AB391J	R	390	1W	Metal Oxide	AA
R507	VRN-VV3AB1R0J	R	1	1W	Metal Film	AA
R508	VRD-RA2BE153JY	R	15k	1/8W	Carbon	AA
R509	VRD-RA2BE153JY	R	15k	1/8W	Carbon	AA
R511	VRN-MD2AL181J	R	180	1/10W	Metal Film	AA
R512	VRD-RM2HD5R6JY	R	5.6	1/2W	Carbon	AA
R521	VRD-RA2BE562JY	R	5.6k	1/8W	Carbon	AA
R529	VRD-RA2BE223JY	R	22k	1/8W	Carbon	AA
R530	VRS-CY1JF334JY	R	330k	1/16W	Metal Oxide	AA
R531	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R532	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R533	VRD-RA2BE393JY	R	39k	1/8W	Carbon	AA
R601	VRS-SV2HC102J	R	1k	1/2W	Metal Oxide	AA
R602	VRD-RA2BE393JY	R	39k	1/8W	Carbon	AA
R603	VRD-RA2BE223JY	R	22k	1/8W	Carbon	AA
R604	VRD-RA2BE393JY	R	39k	1/8W	Carbon	AA
R605	VRD-RM2HD823JY	R	82k	1/2W	Carbon	AA
R606	VRN-VV3DB1R2J	R	1.2	2W	Metal Film	AA
R607	VRD-RM2HD270JY	R	27	1/2W	Carbon	AA
R609	VRD-RA2BE154JY	R	150k	1/8W	Carbon	AA
R610	VRD-RA2BE102GY	R	1k	1/8W	2% Carbon	AB
R611	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R612	VRN-MD2AL123J	R	12k	1/10W	Metal Film	AA
R613	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R614	VRS-SV2HC100J	R	10	1/2W	Metal Oxide	AA
R615	VRS-VV3DB682J	R	6.8k	2W	Metal Oxide	AA
R616	VRN-VV3ABR47J	R	0.47	1W	Metal Film	AA
R618	VRS-VV3DB391J	R	390	2W	Metal Oxide	AA
R619	VRS-VV3LB562J	R	5.6k	3.0W	Metal Oxide	AB

Ref. No.	Part No.	★	Description			Code
R620	VRS-VV3AB472J	R	4.7k	1W	Metal Oxide	AA
R622	VRD-RA2BE102JY	R	1k	1/8W	Carbon	AA
R623	VRD-RM2HD184JY	R	180k	1/2W	Carbon	AA
R624	VRN-MD2AL472J	R	4.7k	1/10W	Metal Film	AA
R625	VRN-VV3DB4R7J	R	4.7	2W	Metal Film	AB
R626	VRD-RM2HD470JY	R	47	1/2W	Carbon	AA
R633	VRD-RA2BE333JY	R	33k	1/8W	Carbon	AA
R634	VRD-RA2BE103JY	R	10k	1/8W	Carbon	AA
R641	VRN-SV2HCR47J	R	0.47	1/2W	Metal Film	AA
R651	VRN-MD2AL223J	R	22k	1/10W	Metal Film	AA
R652	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R653	VRN-MD2AL822J	R	8.2k	1/10W	Metal Film	AA
R654	VRN-MD2AL273J	R	27k	1/10W	Metal Film	AA
R655	VRN-MD2AL391J	R	390	1/10W	Metal Film	AA
R656	VRN-MD2AL100J	R	10	1/10W	Metal Film	AA
R658	VRD-RA2BE101JY	R	100	1/8W	Carbon	AA
R663	VRD-RA2BE101JY	R	100	1/8W	Carbon	AA
R701	VRW-KQ3NC3R9K	R	3.9	7.0W	Cement	AE
R704	VRN-SV2HC1R0J	R	1	1/2W	Metal Film	AA
R707	VRS-VV3DB104J	R	100k	2W	Metal Oxide	AB
R708	VRD-RA2BE681JY	R	680	1/8W	Carbon	AA
R709	VRN-VV3DBR47J	R	0.47	2W	Metal Film	AB
R710	VRN-VV3DBR39J	R	0.39	2W	Metal Film	AA
R711	VRD-RA2BE682JY	R	6.8k	1/8W	Carbon	AA
R712	VRD-RA2BE152JY	R	1.5k	1/8W	Carbon	AA
R716	VRD-RA2BE562JY	R	5.6k	1/8W	Carbon	AA
⚠ R751	VRC-UA2HG825KY	R	8.2M	1/2W	Solid	AA
⚠ R752	VRC-UA2HG825KY	R	8.2M	1/2W	Solid	AA
R753	VRD-RM2HD124JY	R	120k	1/2W	Carbon	AA
R754	VRD-RM2HD150JY	R	15	1/2W	Carbon	AA
R755	VRD-RA2BE221JY	R	220	1/8W	Carbon	AA
R756	VRD-RM2HD270JY	R	27	1/2W	Carbon	AA
R757	VRN-MD2AL151J	R	150	1/10W	Metal Film	AA
R801	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R802	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R803	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R804	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R805	VRN-MD2AL822J	R	8.2k	1/10W	Metal Film	AA
R806	VRN-MD2AL123J	R	12k	1/10W	Metal Film	AA
R807	VRN-MD2AL103J	R	10k	1/10W	Metal Film	AA
R808	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R809	VRD-RA2BE224JY	R	220k	1/8W	Carbon	AA
R812	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R813	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R1001	VRN-MD2AL221J	R	220	1/10W	Metal Film	AA
R1002	VRN-MD2AL331J	R	330	1/10W	Metal Film	AA
R1003	VRN-MD2AL471J	R	470	1/10W	Metal Film	AA
R1004	VRN-MD2AL821J	R	820	1/10W	Metal Film	AA
R1005	VRN-MD2AL181J	R	180	1/10W	Metal Film	AA
R1011	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1012	VRD-RA2BE271JY	R	270	1/8W	Carbon	AA
R1013	VRD-RA2BE101JY	R	100	1/8W	Carbon	AA
R1014	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1015	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1016	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1017	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1019	VRN-MD2AL392J	R	3.9k	1/10W	Metal Film	AA
R1020	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1021	VRN-MD2AL153J	R	15k	1/10W	Metal Film	AA
R1022	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1023	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1024	VRN-MD2AL122J	R	1.2k	1/10W	Metal Film	AA
R1025	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1026	VRN-MD2AL224J	R	220k	1/10W	Metal Film	AA
R1028	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1030	VRN-MD2AL102J	R	1k	1/10W	Metal Film	AA
R1031	VRD-RA2BE562JY	R	5.6k	1/8W	Carbon	AA
R1032	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1034	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1035	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1036	VRN-MD2AL332J	R	3.3k	1/10W	Metal Film	AA
R1037	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1038	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1039	VRN-MD2AL223J	R	22k	1/10W	Metal Film	AA
R1040	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1041	VRN-MD2AL101J	R	100	1/10W	Metal Film	AA
R1042	VRD-RA2BE101JY	R	100	1/8W	Carbon	AA

Ref. No.	Part No.	★	Description	Code
R1046	VRN-MD2AL101J	R	100 1/10W Metal Film	AA
R1048	VRS-CY1JF102JY	R	1k 1/16W Metal Oxide	AA
R1050	VRN-MD2AL392J	R	3.9k 1/10W Metal Film	AA
R1051	VRN-MD2AL683J	R	68k 1/10W Metal Film	AA
R1072	VRN-MD2AL101J	R	100 1/10W Metal Film	AA
R1073	VRN-MD2AL101J	R	100 1/10W Metal Film	AA
	BALUN			
FB601	RBLN-0091GEZZY	R	Ferrite Bead	AB
	SWITCHES			
⚠ S702	QSW-P0591CEZZ	R	Switch	AQ
S1001	QSW-K0003AJZZ+	R	Switch, CH UP	AB
S1002	QSW-K0003AJZZ+	R	Switch, CH DOWN	AB
S1003	QSW-K0003AJZZ+	R	Switch, VOL UP	AB
S1004	QSW-K0003AJZZ+	R	Switch, VOL DOWN	AB
S1005	QSW-K0003AJZZ+	R	Switch, PICTURE/PRESET	AB
	MISCELLANEOUS PARTS			
⚠ ACC701	QACCZ2008PEZZ	R	AC Cord	AM
⚠ F701	QFS-C3229CEZZ	R	Fuse, T3.15A/250V	AD
⚠ FH701	QFSHD1013CEZZ+	R	Fuse Holder	AC
⚠ FH702	QFSHD1014CEZZ+	R	Fuse Holder	AC
J402	QJAKE0210CE04	R	Jack, Video	AC
J403	QJAKE0210CE09	R	Jack, Audio	AC
J409	QJAKHA004WJZZ	R	Jack, AV-1 IN	AE
P302	QPLGN0461CEZZ	R	Plug, 4pin(S)	AB
⚠ P601	QPLGN0660CEZZ	R	Plug, 6pin(F)	AC
P602	LHLDW1104PEZZ	R	Holder (H)	AB
P603	QPLGN0341CEZZ	R	Plug, 3pin(TP651-3)	AA
P701	QPLGN0260CEZZ	R	Plug, 2pin(M)	AC
⚠ P702	QPLGN0269GEZZ	R	Plug, 2pin	AB
P1001	LHLDW1105PEZZ	R	Holder (K)	AB
P1002	QPLGN0561CEZZ	R	Plug, 5pin(BC)	AB
RDA302	PRDAR0340PEFW	R	Heat Sink for IC302	AE
RDA501	PRDAR0118GJFW	R	Heat Sink for IC501	AD
RDA602	PRDAR0224PEFW	R	Heat Sink for Q602	AF
RDA701	PRDARA028WJFW	R	Heat Sink for IC701	AE
RMC1001	RRMCU0222CEZZ	R	Remote Receiver	AL
TP201	QLUGP0102PEZZ	R	Lug, Test Point	AA
	LHLDP1066PE00	R	Holder	AC

DUNTKB509WEA7
PWB-B CRT UNIT

	TRANSISTORS			
Q870	RH-TX0110BMZZ+	R	TX-0110BM	AC
Q871	RH-TX0110BMZZ+	R	TX-0110BM	AC
Q872	RH-TX0110BMZZ+	R	TX-0110BM	AC
Q883	RH-TX0124BMZZ+	R	TX-0124BM	AC
Q885	RH-TX0124BMZZ+	R	TX-0124BM	AC
Q887	RH-TX0124BMZZ+	R	TX-0124BM	AC
	DIODES			
D881	VHD1SS244//-1Y	R	1SS244	AB
D882	VHD1SS244//-1Y	R	1SS244	AB
D883	VHD1SS244//-1Y	R	1SS244	AB
D884	VHD1SS119//-1Y	R	1SS119	AA
D885	VHD1SS119//-1Y	R	1SS119	AA
D886	VHD1SS82///1AY	R	1SS82	AC
D887	VHD1SS82///1AY	R	1SS82	AC
D888	VHD1SS82///1AY	R	1SS82	AC
	CAPACITORS			
C871	VCCCCY1HH471J	R	470p 50V Ceramic	AA
C872	VCCCCY1HH471J	R	470p 50V Ceramic	AA
C873	VCCCCY1HH471J	R	470p 50V Ceramic	AA
C875	VCKYPA2HB102K+	R	1000p 500V Ceramic	AA
C876	RC-KZ0150CEZZ	R	1000p 3.15kV Ceramic	AB
C878	VCEA0A2EW106M+	R	10 250V Electrolytic	AD
C880	VCCCCY1HH471J	R	470p 50V Ceramic	AA
C881	VCKYPA1HB471K+	R	470p 50V Ceramic	AA
C882	VCKYPA1HB471K+	R	470p 50V Ceramic	AA
C886	VCKYPA2HB102K+	R	1000p 500V Ceramic	AA
	RESISTORS			
R879	VRN-MD2AL471J	R	470 1/10W Metal Film	AA
R880	VRN-MD2AL471J	R	470 1/10W Metal Film	AA
R881	VRN-MD2AL471J	R	470 1/10W Metal Film	AA
R882	VRS-VV3DB153J	R	15k 2W Metal Oxide	AA
R883	VRD-RM2HD272JY	R	2.7k 1/2W Carbon	AA
R884	VRS-VV3DB153J	R	15k 2W Metal Oxide	AA
R885	VRD-RM2HD272JY	R	2.7k 1/2W Carbon	AA
R886	VRS-VV3DB153J	R	15k 2W Metal Oxide	AA
R887	VRD-RM2HD272JY	R	2.7k 1/2W Carbon	AA
R892	VRN-MD2AL102J	R	1k 1/10W Metal Film	AA
R893	VRN-MD2AL102J	R	1k 1/10W Metal Film	AA
R894	VRN-MD2AL102J	R	1k 1/10W Metal Film	AA
R895	VRN-MD2AL471J	R	470 1/10W Metal Film	AA
R896	VRN-MD2AL471J	R	470 1/10W Metal Film	AA
R899	VRN-MD2AL471J	R	470 1/10W Metal Film	AA
	MISCELLANEOUS PARTS			
⚠ SC883	QSOCV0016PEZZ	R	Socket	AF
P882	LHLDW1105PEZZ	R	Holder (K)	AB
P884	LHLDW1104PEZZ	R	Holder (H)	AB

MISCELLANEOUS PARTS

SP301	VSP1206PB50WA	R	Speaker	AP
SP302	VSP1206PB50WA	R	Speaker	AP
	QCNW-A230WJZZ	R	Connecting Cord	AD
	QCNW-A720WJZZ	R	Connecting Cord	AD
	QCNW-2381PEZZ	R	Connecting Cord	AG

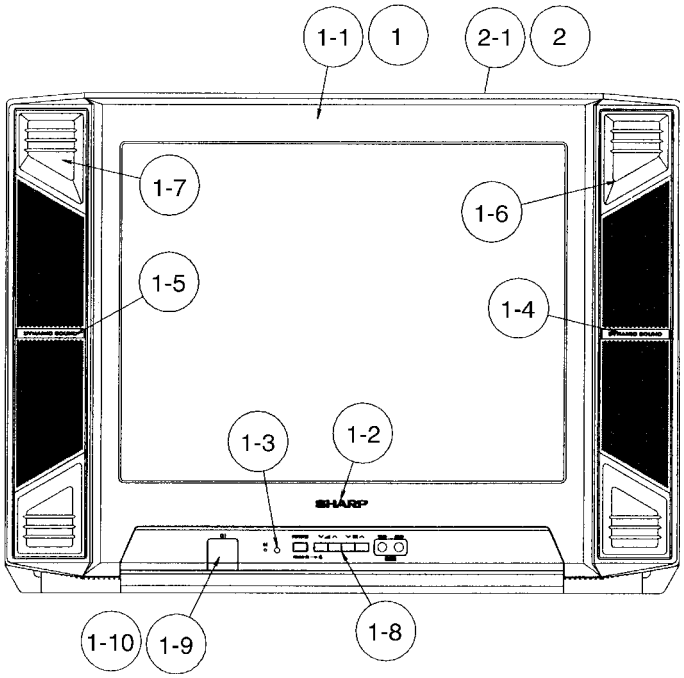
SUPPLIED ACCESSORIES

	ACCESSORIES			
	RRMCG1342PESA	R	Infrared-R/C	AU
	TiNS-A414WJZZ	R	Opearation Manual	AK
	TMAPCA015WJZZ	R	Circuit Diagram	AC
	ACCESSORIE(NOT REPLACEMENT ITEM)			
	TCAUA0002PEZZ	-	Caution Card	—

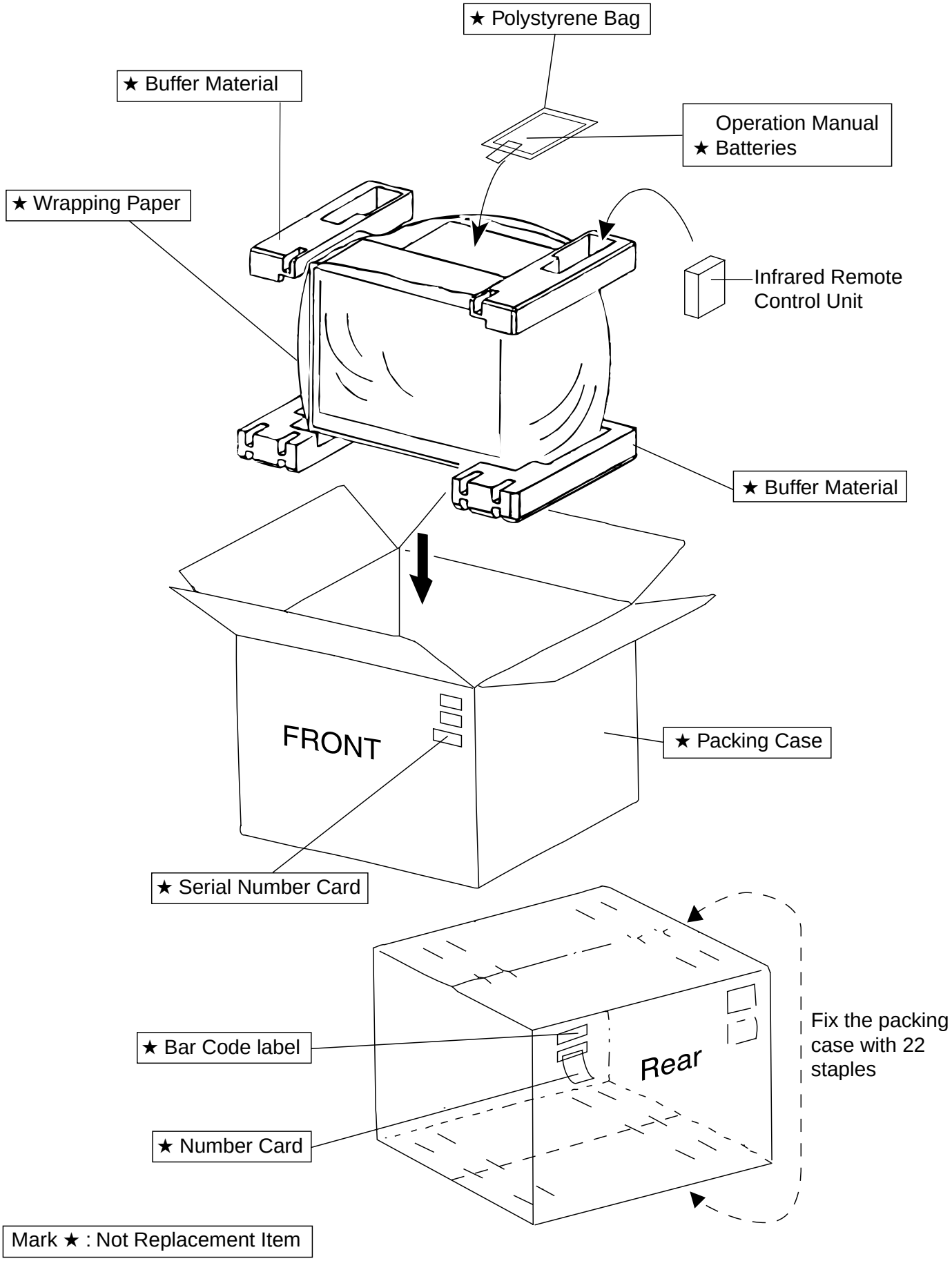
PACKING PARTS
(NOT REPLACEMENT ITEM)

SPAKCA356WJZZ	-	Packing Case	—
SPAKX2756PEZZ	-	Buffer Material	—
SSAKA0031PEZZ	-	Polyethylene Bag	—
SSAKH0016PEZZ	-	Wrapping Paper	—
TLABK0002PEZZ	-	Serial No. Label	—
TLABN0001PEZZ	-	No. Card	—
TLABVA100WJZZ	-	Bar Code label	—

Ref. No.	Part No.	★	Description	Code
			CABINET PARTS	
1	CCABAA173WEV0	R	Front Cabinet Ass'y	BH
1-1	*Not Available*	-	Front Cabinet	—
1-2	HBDGB0015PESB	R	SHARP Badge	AE
1-3	HDECQ0186PESA	R	R/C LED Dec.	AD
1-4	HDECA0083PESA	R	SP Dec.-R	AE
1-5	HDECA0084PESA	R	SP Dec.-L	AE
1-6	HDECQ0187PESB	R	SP Net-R	AQ
1-7	HDECQ0188PESB	R	SP Net-L	AQ
1-8	JBTN-0345PESB	R	Control Button	AH
1-9	JBTN-0347PESB	R	Power Button	AD
1-10	MSPRC0016PEFW	R	Power Button Spring	AB
2	CCABBA116WEV0	R	Rear Cabinet Ass'y	BA
2-1	*Not Available*	-	Rear Cabinet	—



PACKING OF THE SET



Mark ★ : Not Replacement Item

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